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Industry at the Crossroads

By C. J. Stark

MERICAN business, which in a large sense means American industry, again finds itself favored by the dawn of a wonderful opportunity. Rarely have fundamental factors grouped themselves in a fashion so uniformly sound and so prophetic of great future trade developments. Both nationally and internationally, prospects are decidedly bright. The world seems truly chastened by the paralyzing aftermath of war and anxious to take up in earnest the normal and upbuilding pursuits of settled peace.

Domestic affairs present a strong exhibit. General confidence has replaced hesitation and uncertainty. Inequalities between producing groups largely have been wiped out. Enterprise and progress everywhere are receiving fresh impetus. Financially, the country was never stronger; economically, more stable; or politically, more assured of orderly guidance for several years at least. The time seems ripe for another period of important national expansion. A new cycle in the evolution of business apparently is at hand.

But opportunity in itself does not bring real and lasting prosperity. It presents only the occasion and not the substance. By what orderly and rational stages the situation is to be brought to its ultimate development, will the degree of its fruition or the period of its continuance, be determined. Demands for the things that industry makes have grown large in recent months and promise to keep on increasing. This movement will invite speculation, over-confidence, over-extension and the usual pitfalls of a great business awakening. These excesses turned the fine prospects of 1920 into an economic shambles, the distressing effects of which have been felt by business ever since. Are the lessons of 1921 still so vivid and well remembered that they will exert a steadying force on this occasion?

American business vision and sagacity again are to be put to the supreme test. A program of courage with caution, decision with discretion and faith without folly will mean a prolonged period of prosperity for the United States, probably one that will outrun the present year. A spirit of blind faith, a lack of self-restraint or an attitude of go-as-you-please are likely to bring, as they have always done, a brilliant opportunity to an early and unsatisfactory end.

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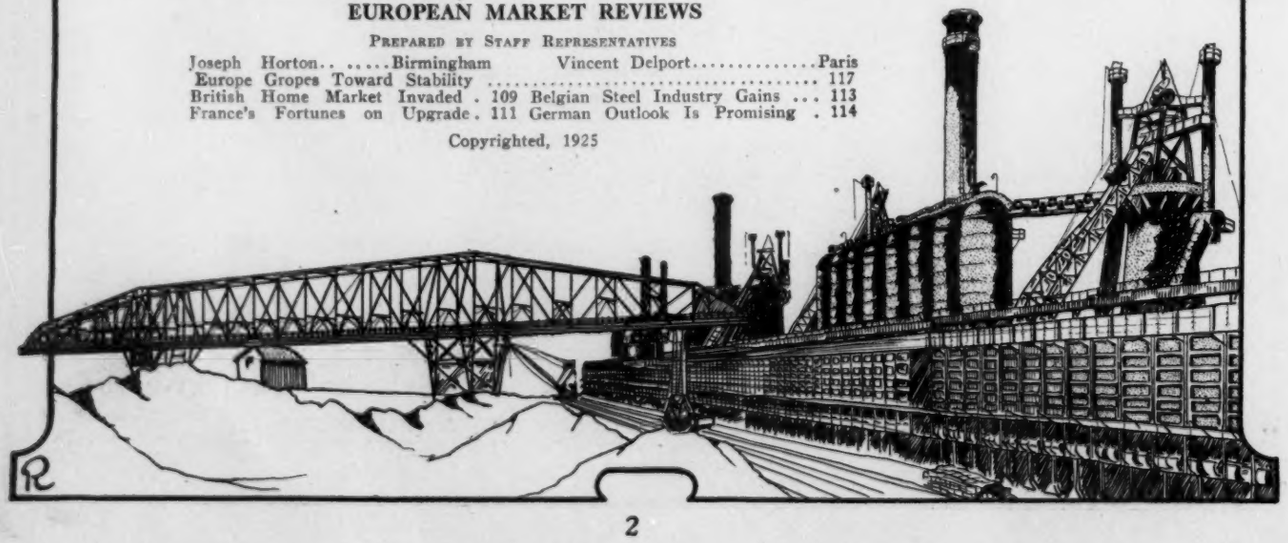


The Old Order Changeth —

But the Process Is Slow and Painful

BY E. L. SHANER

AMERICAN manufacturers gradually are freeing themselves from the apron strings of convention. The mere fact a thing has been done the same way for 30 years no longer is considered a good reason for continuing to do it that way. Tradition is losing the firm grip it once had on the minds of the majority of industry's executives.

Although this tendency to override precedent is not new, it is particularly noticeable now, when through dint of several years of bitter experience, manufacturers are taking to heart the stern lessons of postwar readjustment. Officials who have been through this school do not waste time on the pedigree of a new idea; they are likely to judge it purely on its merits.

Hermitages of Research

By way of illustration, let us compare the old and new attitudes of industry toward scientific and economic advancement. Twenty years ago each plant was an institution unto itself. Manufacturers seldom exchanged ideas or experience, the result being that often valuable development work was lost to industry because it did not come to the attention of men capable of recognizing its merit. Technical research was carried on behind bolted doors and anything offering the slightest promise of improving current methods or practice promptly was shrouded in a cloak of mystery. Frequently extravagant precautions were taken to prevent details of an impending invention from reaching the ears and eyes of competitors.

Old steelmakers are familiar with the rivalry that existed between Phillip Moen, of Washburn & Moen, Worcester, Mass., and John W. Gates, who at one time in his active career was operating a mill at DeKalb, Ill. Moen learned that Gates was trying out a new method of treating wire, and resorting to the usual procedure of that period, he sent one of his best foremen to DeKalb with instructions to get a job in the mill as a mechanic, study the new process under cover of his disguise, and report back to Worcester as soon as possible with the information.

The foreman left for Illinois and within a few days notified Moen that he had been hired and was rapidly gathering the desired facts. But as time went on and no further word was received, Moen began to wonder if everything was all right. Finally, just as he was on the point of investigating, he received this curt telegram from DeKalb:

'We have just kicked your foreman out of the plant."

JOHN W. GATES.

Contrast the policy of which this incident is typical with the present tendency toward co-operative effort. Today producers, fabricators and consumers in the metalworking industries rapidly are coming to the belief that the most effective way to promote technical and economic advancement is to work collectively. Manufacturers who have tried this plan have met with such pronounced success that there no longer can be any doubt as to its possibilities.

Where The Money Comes From

One popular method of administering this plan is to establish a research organization which is supported by assessments on the member companies. In many

But Will He Do It?

"Now that you have these new ties, don't you think you might throw away those old faded ones?"

cases the amounts contributed to the common fund by each member are determined on a basis of production or gross income. Producers belonging to one research group pay a certain amount for each ton of product turned out annually. In another organization the rate is based on each member's plant capacity. In a third case the fee is proportionate to the average number of employes.

Although many remarkable achievements can be credited to co-operative campaigns, none is more impressive than that of the American Institute of Steel Construction, an organization of about 200 fabricators of structural steel. In practically two years of intensive work, the institute has done more to advance the interests of the industry it serves than all the companies, working individually, accomplished in the preceding 35 years.

The institute succeeded the National Steel Fabricators' association which was organized during the war. When that organization was disbanded in November, 1921, a number of its members felt that a new body should be formed to promote the proper uses of structural steel. Consequently, in May, 1922, Lee H. Miller, now chief engineer of the institute, visited many of the fabricators of the country and explained the proposed program. This preliminary work was crystallized at the Pittsburgh convention in November, when a definite working plan was adopted.

The first problem undertaken by the infant organization was to completely rewrite the specifications for structural steel. The real significance of this revolutionary step may be realized when it is explained that no important change in building codes had been made since the advent of bessemer steel shapes in 1884, notwithstanding the fact the converter metal long since had been superseded by open-hearth steel.

Backed by the support of the fabricators of the institute a committee of five eminent engineers and architects actually prepared in less than six months a standard specification on the design, fabrication and erection of structural steel. This committee, composed of George F. Swain, Milo S. Ketchum, E. R. Graham, W. J. Thomas and Wilbur J. Watson, in one stroke wiped out engineering absurdities of 35 years standing. It was a fine example of the power of collective action in contrast with the futility of disjointed effort.

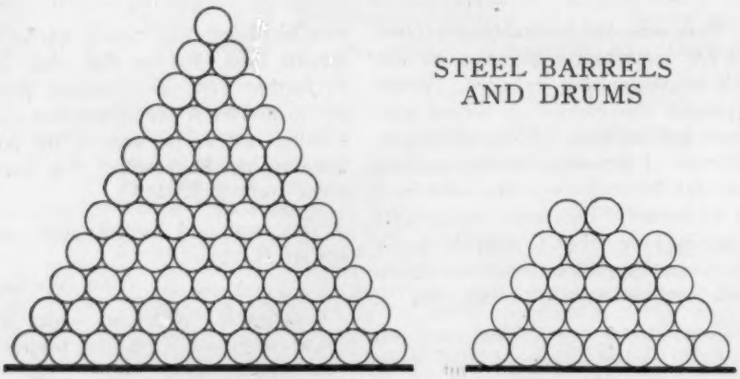
With this one feather in its cap, the institute set out for new honors. It carried its new specification to important cities, urging its adoption as the standard building code. While successfully prosecuting this campaign, the institute secured the services of Charles F. Abbott as executive director.

In the past year, under his supervision, the activities of the organization have been greatly expanded. After a year of painstaking effort, a committee developed a code of standard practice which accurately defines the methods of handling business involving structural steel. Competent authorities declare this document embodies the best outline of the obligations and responsibilities of seller and buyer that has been prepared for any industry.

In addition, the institute is studying the traffic problem with a view of promoting greater efficiency in this phase of distribution of structural steel. A system of cost accounting specially adapted to fabricating shops is being introduced and many other problems associated with the production and marketing are being considered.

Back of all of these activities is a determination to build up a "structural steel consciousness," which it is hoped will familiarize the public with the favorable properties of steel for construction. The ultimate goal of this campaign is to extend the use of steel for construction beyond the limits of the present market.

But in achieving prompt success in their co-operative activities the steel fabricators are only repeating the ex-



Before Simplification
66 Sizes

After Simplification
24 Sizes

Two Out of Three Sizes Are Found Unnecessary

ELIMINATION of thousands of unnecessary varieties and sizes of manufactured articles was accomplished in 1924. The following table shows the reductions made in certain metal products. Roughly, two out of every three varieties are found to be superfluous, according to the record in 1924. Of 6561 items for the 14 products listed below, only 2140 or less than one-third, were retained in the process of simplification. Steel barrels and drums furnish a typical example, the reduction from 66 to 24 sizes conforming closely to the general average for all metal products.

Product	Number of items shown in survey	Reduced to
Barrels and drums, steel	66	24
Beds and spring	78	4
Boilers, range	130	13
Bolts and nuts (farm equipment)	1500	840
Eaves trough, conductor pipe	21*	7*
Fence, woven wire	552	69
Files and rasps	1351	496
Lath, metal	125	24
Lockers, steel	85	17
Reinforcing bars, steel	40	11
Sheets, steel	1819	263
Tanks, hot water storage	120	14
Terne plate	9*	7*
Tools, forged	665	351
Totals	6561	2140

*Weights

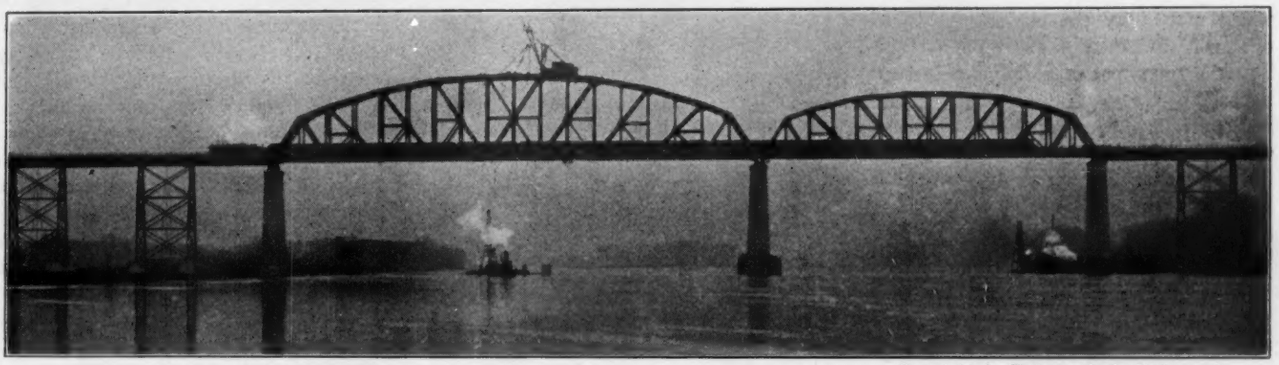
perience of many other organizations. Everyone is familiar with the story of how the malleable iron producers nursed their once sickly industry to sturdy convalescence through the activities of the American Malleable Castings association. The cement industry owes its marvelous growth in the last decade largely to the work of a central research bureau. A group of electric steel founders is finding that co-operative research is profitable. Until makers of refractories decided to attack their common problems collectively little progress was made. Now their co-operation is being rewarded by the result of their association's laboratory at Mellon institute. Foundrymen worked for years in a hit-and-miss fashion to learn how to obtain better results with molding sand. The first hope of success came two years ago when they attacked the problem through organized effort, each founder contributing to the support of a large committee of experts.

While most of these organizations deal primarily with technical problems, many of them are turning their attention to questions of distribution. This has led to co-operative marketing, a form of organized effort that has been highly developed within the past few years. The work consists of a thorough canvass of the markets of a certain product, the object being to develop new applications in old markets and to create new outlets. Almost invariably this involves an educational campaign, including publicity and advertising. Its aim is to create a "consciousness" of the product among its potential users in a way similar to that described in a foregoing paragraph in connection with fabricated steel.

One of the best examples of co-operative marketing is furnished by the work of the Copper and Brass Research association. This organization set out to popularize copper and brass by stressing the resistance of these metals to corrosion and showing that while higher in cost, copper and brass products are really cheaper than certain articles of other material because of their longer life. The pyramiding of sales proves the value of this campaign.

Sheet and tin plate makers also have embarked on a trade extension program through the activities of the National Association of Sheet & Tin Plate Manufacturers. Markets are being studied and a united advertising campaign is being waged to acquaint potential users with the desirable properties of various grades of sheets and tin plate. Machine tool builders, through the National Machine Tool Builders' associa-

In restoring efficiency in their operating departments American railroads in 1924 wrote one of the most interesting chapters in the history of transportation. While this achievement in a large measure is due to the initiative and resourcefulness of the roads acting individually, many of the accomplishments contributing to the success of the entire program were the result of co-operative action. In joining hands to improve their condition, the carriers not only increased their earnings to a more nearly satisfactory basis, but they gave industry a transportation service far better than it has had for a long time. One feature of the rehabilitation of transportation systems is the elimination of "bottle-necks" on trunk lines. The Castleton bridge, which cuts off the Albany "bottle-neck" on the New York Central, with the first train crossing it, is shown above.



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tion also are engaged in advancing the interests of their industry. The association is using the phrase "Master Tools of Industry" to good advantage, and in addition to studying weak points in the distribution of machines is giving its members a high grade service on economic factors affecting the business.

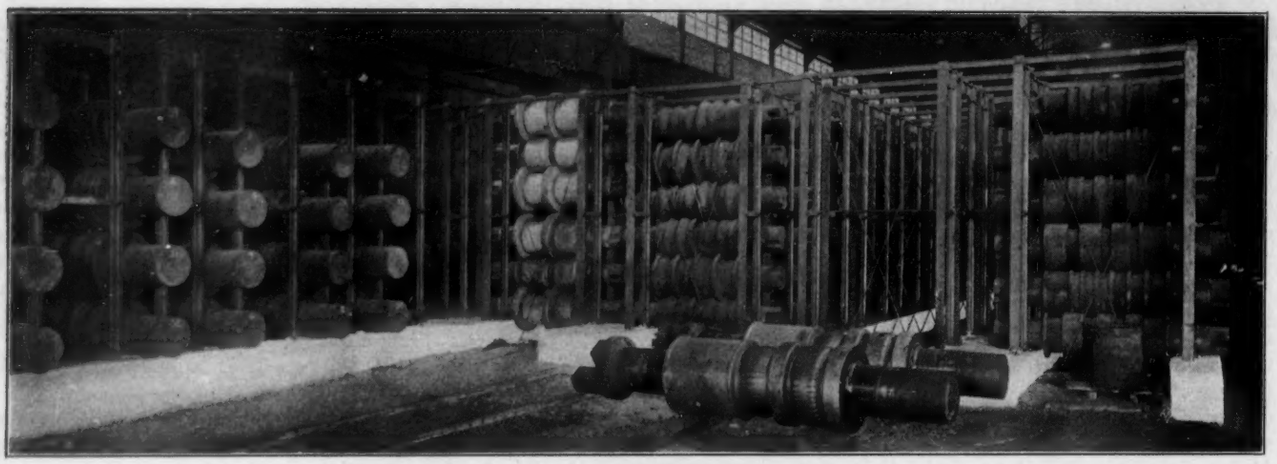
One of the most impressive illustrations of the value of joint consideration of common problems is found in the work of the division of simplified practice of the United States department of commerce. By working with manufacturers, distributors and users of certain products, the department has been able to encourage the simplification of varieties of shapes and sizes. Roughly speaking, the investigations of metal products in 1924 resulted in a reduction from 6561 to 2140 items in connection with 14 products. Similar reductions were made in the sizes of numerous non-metal articles such as paving brick, roofing slate, concrete blocks, hollow tile, milk bottles, etc. Approximately 200 articles are scheduled for survey in 1925.

Credit for this commendable work is due to the department, for its initiative in providing the facilities for simplification, and to the thousands of manufacturers, dealers, users and technical and trade associations who co-operate in formulating the approved list of sizes and shapes.

Closely allied with simplification is standardization. At present there is no generally accepted standard for foundry patterns and flasks. The yards of many casting plants are stacked high with flasks of every conceivable size and shape, many of them never to be used again.

A committee on standardization has been working about a year to formulate standard patterns, plates and flasks. It has drawn up a tentative list of sizes of plates and flasks and has recommended certain practice for marking patterns. The standard, when completed, will provide for an adequate range of sizes for all commercial foundry work, so that with a supply of standard equipment a foundryman can handle any reasonable job without the necessity of having to build new flasks. One foundry authority declares this standard when adopted will save the industry $10,000,000 annually.

One of the weakest links in the nation's distribution system is inopportune and poorly advised buying by railroads and federal, state and municipal governments. Not only do purchasing agents for these institutions have an unerring faculty for going into the market when it already is jammed with orders, but many of them lack unprejudiced information regard-



These Rolls Are Used Frequently But in the Steel Industry There Are Thousands Upon Thousands of Smaller Ones Seldom Used That Could Be Scrapped if Unnecessary Sizes and Shapes of Rolled Products Were Eliminated

ing the merits of even staple articles and equipment.

Recently steps were taken in various directions to improve this situation. The railroad executives are setting in motion machinery to systematize and unify purchases so that part of the waste caused by the present lax methods will be eliminated. The United States department of commerce, through Secretary Hoover, is preparing standard specifications for the use of government purchasing agents. Specifications for more than 200 articles already have been written and are being used not only by federal, state and city officials, but also by purchasing agents of a few large industrial concerns.

The saving resulting from the voluntary adoption of this improved method of purchasing is impressive. An incident illustrating the far-reaching effect of this plan is related in the annual report of the secretary of commerce, as follows:

We had to consider the specifications for a wearing part in automobiles. The products of different manufacturers were secured and were placed under exhaustive chemical, physical, and actual operating study. It was found that under equal conditions this wearing part had from manufacturer A, for instance, a life of one year, from manufacturer B, a life of two years, and from manufacturer C, a life of three years, and so on, with all sorts of variations in between. In this case, we communicated the result of the investigation to the manufacturers not as to names but purely as to qualities disclosed and the physical characteristics which were developed as necessary. The result of the conference and study which grew out of this matter was that in the next offering of these parts none of them failed on the long-life test, and the improvements had been put into general production. A computation made by manufacturers shows that the benefit to the public automobile user through the longer life amount to a saving of at least $15,000,000 a year, and it is entirely a saving of waste.

Again the full possibilities of this plan depend on the co-operative action of those who employ it.

Still another application of joint action in industry is stabilization. It is difficult to guess what would have happened if the coal interests, including producers, distributors and buyers had been permitted to continue to muddle along individually in their vain efforts to rid the bituminous industry of its wasteful methods. Fortunately, through the harmonious work of thousands of interested companies, organizations and individuals, the industry now is on the road to stabilization.

Herbert Hoover, who is largely responsible for the program that brought order out of chaos in the mines, sums up the problem in the following words in his annual report as secretary of commerce:

"Due to the war and to periods of profiteering, far too many mines had been developed and placed in operation. There were approximately 30 per cent too many mines engaged in the business and holding to themselves 30 per cent more labor than would be necessary to produce the nation's coal if they were continuously employed. One result of this intermittent employment is that a large proportion of the workers, although employed at a very high minimum daily wage, did not receive a sufficient annual employment to maintain

This Is One of the Many Small Mountains of Foundry Flasks of Miscellaneous Sizes and Shapes To Be Eliminated When the Present Program of Flask and Pattern Standardization Is Completed

a reasonable standard of living. Thus there grew out of this vicious cycle constant incitement to labor difficulties.

"Investigation showed clearly that the primary remedies needed were (a) sufficient transportation facilities, because car shortages resulted in increase of prices, profiteering, and stimulus to the maintenance of high-cost mines; (b) the reduction of the seasonal character of the industry by the summer storage of coal by the larger commercial and industrial users; and (c) a period of industrial peace so that by avoiding strikes the subsequent profiteering would disappear and thus the fly-by-night and high-cost mines lose their support.

"Through co-operation of trade associations of the principal industrial consumers, through chambers of commerce and public utilities a large amount of regular summer storage has been induced. Through the fine co-operation of the railways, greater equipment and terminal facilities have been provided and car shortages have been largely eliminated. Through co-operation by the department with the unionized operators and with the leaders of the United Mine Workers a long term agreement has been entered upon, which insures industrial peace in the industry.

"These desired remedies have now in a great measure been attained. Here is a case where the saving of economic waste can be measured in the hundreds of millions of dollars."

For Years Each Coal Interest Battled Independently Against the Evils of the Industry. The First Real Step in the Direction of Stability Was Taken When Producers, Distributors and Public Attacked the Problem Collectively

Co-operation Proves Worth

Even the most hide-bound conservative must admit that co-operative effort, as applied to technical and economic research and marketing, has made a good case in court for itself. The evidence is all on one side; there is no one to gainsay the striking effectiveness of pooled resources when properly administered.

This being the case, it is proper to ask what industry will do with this wonderfully potent instrument. Will it utilize it to its fullest possibilities? Will backward manufacturers who thus far have side-stepped every opportunity to co-operate with their contemporaries in promoting their branch of industry continue in this rut? Will some of the stronger companies which up to the present time have felt it beneath their dignity to work harmoniously with their less important competitors still pursue that narrow policy in the face of the evidence of the benefits of co-operation?

These are a few questions to be answered in 1925 and in the following years. It would be sad indeed if the momentum thus far gained should be lost. The metalworking industry is sorely in need of greater co-operative work. In a few branches, the lack of it is noticeably stifling progress.

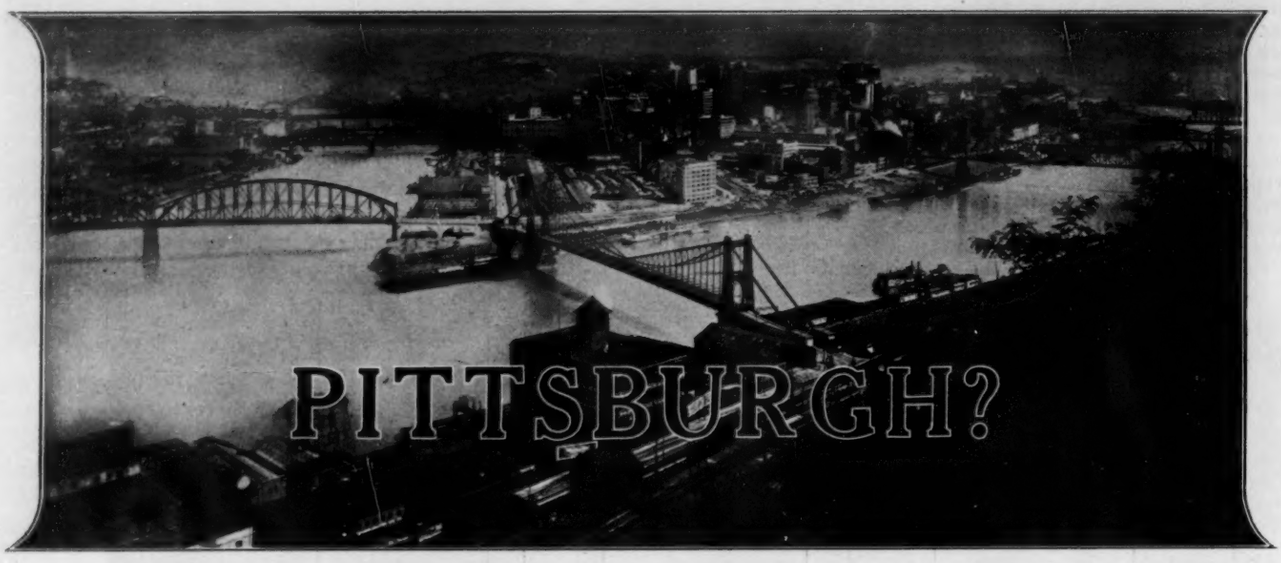
Certain wasteful practices exist which can be eliminated only by collective action. Great strides could be made in the iron, steel and engineering industries by a general crusade against such evils as reciprocal buying and selling, discount for cash, unremunerative consulting service, etc. The entire structure of steel distribution is susceptible to reinforcement, a job to which pooled resources are especially adapted.

Encouraging as are the accomplishments in the field of industrial standardization and simplification, it must be admitted that only the surface of the possibilities in this sphere have been touched. Spans of traveling cranes should be standardized, as should certain parts of equipment such as locomotive cranes, material handling buckets, conveyor systems, etc. Agricultural bars and many other rolled products should be studied with a view of eliminating thousands of unnecessary shapes, sizes and weights. Many mills of the country are cluttered up with countless rolls, many of which have not been used for years. They are costly reminders of the days when it was considered good business to roll anything a customer desired, even if it differed from existing shapes by only a trivial detail.

Co-operative action will benefit industry in proportion to the enthusiasm and loyalty with which it is supported. This means that the attitude of manufacturers should be more uniformly favorable to co-operative programs than now is the case. Old business fueds must be forgotten and arrogance and selfishness of individuals and companies must be submerged when executives get together to attack common problems, if success is to reward their efforts.

Joint action has been proved a powerful weapon against undesirable business practice. Industry, especially its metalworking branches, needs such a weapon to help rid it of certain evils and to improve methods of distribution.

Which Will Rule



Successful Agitation for Abolition of Pittsburgh Basing Point Practice Reflects Extensive Spreading Out of Steel Manufacture

BY A. O. BACKERT

WHEN Andrew Carnegie 23 years ago wrote his famous letter to J. Pierpont Morgan agreeing to sell his interest in the Carnegie Steel Co. for $225,000,000 in gold bonds, a new and remarkable era for the American steel industry was begun.

The formation of the United States Steel Corp. and the policies which have dominated the operations of the leading producer from the date of its organization have exercised a profound effect upon the development and fortunes not only of the manufacture of steel in this country but of many allied fields of enterprise.

This era may well be termed the era of stabilization and of solidification. Under the policy of "live and let live" adopted and persistently pursued by the Steel corporation, the steel industry has enjoyed a wide expansion on a truly national basis. Competition while not restrained has been regulated and composed. Publicity of prices has been fostered. The opportunity thus provided has enabled many rival companies to be built up to a position of great strength and business security. When the Steel corporation was formed in 1901 it controlled about 65 per cent of the productive steel capacity of the country. At the present time its portion is about 45 per cent.

* * *

ON SEPT. 21, 1924 what promises to be another era for the American steel industry was inaugurated. The abolition of the practice of quoting steel prices on a Pittsburgh base plus the freight, as ordered by the federal trade commission, has introduced a set of conditions essentially different from those under which the industry has gone forward during the past 25 years.

While the Steel corporation did not create Pittsburgh plus, this having antedated its organization, its leadership has been a strong factor in the perpetuation of the system. Pittsburgh plus came about as a natural economic outgrowth of the dominant importance of the Pittsburgh district in the steel industry. Pittsburgh tonnage offered to all sections made the market, causing the entire industry to take its cue from that center. Most of the capacity of the Pittsburgh district has been under the control of the Steel corporation. Furthermore, most of the Steel corporation's steelworks and mills have been located within the Pittsburgh zone and its contiguous territory; in its earlier years much more so than at the present time. Probably 50 per cent of its capacity is so concentrated at this time. It has been an almost automatic relationship, therefore, that has made the Steel corporation a chief factor in the continuation of the practice of Pittsburgh plus.

The wiping out of Pittsburgh plus abruptly and for most buyers and sellers, unexpectedly, produced the most violent convulsion the steel industry has experienced in 20 years. It has become a common saying that no development since the formation of the Steel corporation in 1921 produced such a profound effect upon the underlying formation of the industry or is more fraught with consequences of a far-reaching character.

There can be no doubting the statement, the Pittsburgh basing point system has been the keystone of the organization, location and alignment of the American steel industry during the past two decades. It regulated prices to the extent that it formed a common basis from which the industry could take its bearings. It defined competition, depending upon the general breadth of the market. Pittsburgh plus in itself, however, scarcely would have become so effective without the accompanying factor of publicity. The Steel corporation, having adopted a consistent policy of publicity in its relations with the public, has applied this principle generally to its price procedure. Such a combination has served to entrench Pittsburgh plus as an institution within the industry.

* * *

WHILE the Steel corporation probably has not needed Pittsburgh plus to build itself up during the past 15 or 20 years to the strong entity that it represents today, this system has been helpful to it. It is notably true with respect to Steel corporation plants outside the Pittsburgh region of which there are many. During this interval the Steel corporation gradually has spread out its operations to meet the needs of expanding markets through the building of

Steel Industry?

Excess of Western Consumption Over Productive Capacity Leaves Market Leadership to Pittsburgh Though Gap Is Closing

new plants or the enlarging of old ones. Outside of the taking over of the Tennessee Coal, Iron & Railroad Co. which was done under special circumstances in 1907 and some other instances in the earlier years, little capacity has been acquired by purchase. The Steel corporation's policy manifestly is opposed to the buying out of competitors, the reason for which is obvious since such a method likely would be misunderstood by the public. During its existence the corporation has put into plant extensions and betterment the enormous sum of over $340,000,000.

The point is important that most of the capacity built or acquired by the corporation since its organization has tended to decentralize its operations as against Pittsburgh and greatly to entrench it in those localities, favored for steel production, which best could serve the most rapidly growing markets, conspicuously those in the middle western states. Pittsburgh plus has been a contributing factor in getting this new capacity established and seasoned.

It is beside the point that modern metallurgical practice, the employment of constantly larger units in production and most of all, the development of by-product coke manufacture, have made it possible today to produce steel as cheaply in Chicago as in Pittsburgh. This has not been true until in very recent years and probably the Steel corporation itself could not have foretold the time when it laid down Gary or broadened out South Chicago. Lower costs of production at Chicago have not been a main factor in influencing the passing of Pittsburgh plus for the West.

* * *

TODAY with modern and rounded out plants able to dominate the rich middle western market, the Steel corporation has less need for Pittsburgh plus than at any time in its history. Conversely, the independent companies with single or few plants find themselves handicapped without Pittsburgh plus in competing against the many Steel corporation plants when they attempt to continue business on a national scale. This doubtless explains why the independent companies have been so reluctant to give up Pittsburgh plus since they continue to pursue it in some form or other in about the same way as they have done in the past. Under the decree of the federal trade commission which is directed solely against the Steel corporation, they are under no direct obligation not to do so.

So far the theory of the commission that by forcing the Steel corporation as the dominant factor, to drop Pittsburgh as a basing point, it could bring about the elimination of the practice through competition, has not been borne out. The commission has sought to bring about a general system of f.o.b. mill prices with freight to destination, clearly shown. It has frowned upon delivered prices as leading to evasion of its mandate.

Whether in time the commission will be able to unify the selling practice of steel without resorting to complaint and action against the independent companies, is doubtful. It is understood the commission at this time, at least, has no such step in contemplation. It should remain for future economic development and for fluctuating market conditions, eventually to dictate the final answer to this question. Deeply considered, it is not one that may be settled by judicial decree but is purely a matter of economics. From the standpoint of the independent producer, the problem becomes less acute when the market volume is large and more so when general demand is lean.

This raises the fair question whether the Steel corporation, though making all the gestures of stoutly fighting for the retention of Pittsburgh plus, actually was in favor of its abolishment all the time because of the competitive advantage which this would give to it.

That the corporation pursued such a subtly sagacious course appears highly improbable. It is more reasonable to explain its unexpected acquiescence with the cease-and-desist order of the federal trade commission by considerations of public policy. The crusade against the Pittsburgh basing point method in the West had been so developed that it had been considered a matter of public business by numerous state legislatures and seemed susceptible of being carried to where it would be of great political importance.

* * *

THE point was made at the hearings of the federal trade commission that Pittsburgh plus instead of proving a restraint to the upbuilding of steel capacity outside the Pittsburgh district, actually

has stimulated it. Whether the Pittsburgh basing point practice in itself has exercised such an influence, the fact remains that the rest of the country had gained considerably on Pittsburgh in steel capacity during the last 15 or 20 years. Independent companies have located or expanded their plants with Pittsburgh base as an important factor in their calculations. Moreso in former years than now, the advantage of location, as definitely marked by dollars per ton in freight computed from a Pittsburgh basis, has been counted upon by companies to equalize or offset their higher costs against Pittsburgh. This has been especially applicable to the industry in the East and remains so.

When the Steel corporation was formed, its total steel ingot capacity was approximately 12,000,000 to 13,000,000 tons. Today it is in excess of 23,000,000 tons. The greater part of this enlargement has come through extensions outside the Pittsburgh area. The great Gary works has been built step by step over a period of the last 16 to 18 years and is still in process of being rounded out. The Tennessee Coal, Iron & Railroad Co. was acquired in 1907. Important extensions have been made at South Chicago, Cleveland, Youngstown, Duluth and other points. While the corporation now is engaged in expending a great sum of money in the Pittsburgh district, amounting to many millions, this largely is for the purpose of modernizing and refining existing steelworks and mills and not for the laying down of new capacity. The Homestead works, which is now in the process of rebuilding, is an example of this program.

Pittsburgh District Production

	Pig iron	Steel ingots
1910	5,330,982	7,145,711
1911	5,116,442	6,451,373
1912	6,107,226	7,786,455
1913	5,999,539	7,669,221
1914	4,665,893	5,854,414
1915	5,970,407	7,747,380
1916	7,239,913	9,272,996
1917	6,226,601	8,970,353
1918	6,357,660	8,515,984
1919	5,719,842	7,621,492
1920	6,170,881	8,553,035
1921	3,371,517	4,309,038
1922	4,857,755	6,853,354
1923	6,605,541	8,459,931
1924*	5,085,000	6,975,000

*Estimated.

Actually, it is fair to say that the destruction of Pittsburgh plus came about primarily through the development of both steel consumption and production now in the great middle western market commonly tributary to Chicago. The growth of the Chicago district as an iron and steel producer during the past 15 or 20 years has been most impressive. In 1910 the steelworks in the district had the power to produce a total of approximately 4,868,874 tons of ingots. By 1924 this had increased approximately to 8,860,000 tons. While the entire American industry in the period of 1913 to 1924 was gaining only 50 per cent, the Chicago region has expanded 80 per cent. The increase in pig iron, while less spectacular has been no less important. In 1910 the furnaces were able to produce 5,715,470 tons, theoretically. By 1924 this had grown to 7,831,000 tons. The Chicago gain from 1910 to 1924 was 44 per cent.

* * *

TOTAL steel productive capacity in the Chicago district today is far below the normal or potential consumption of the surrounding territory that logically draws its supplies from that region. On this basis the normal demands of the great industrial and agricultural belt embraced in the states of Illinois, Wisconsin, Iowa, Missouri, Indiana, most of Michigan and western Ohio would be approximately 8,000,000 to 10,000,000 tons of finished material annually. Furthermore, these demands are growing steadily. This excess of normal requirements over a possible output is placed as high as 40 per cent.

The extra tonnage necessary to meet the needs of the Chicago zone is taken from mills in the Pittsburgh district, in Ohio, in St. Louis and elsewhere. Just how much tonnage has been moving each year from Pittsburgh territory and other eastern sources into the Chicago market, there are no exact figures to show. The most illuminating statement in this respect was that introduced by the Steel corporation in the Pittsburgh basing point hearings. This showed that exclusive of rails, the amount of finished products taken by consumers in the Chicago district from mills east of Illinois and excluding the Gary-Indiana Harbor zone, averaged around 1,500,000 tons annually from 1916 to 1919 inclusive or close to 47 per cent of the total demands. In turn Chicago mills shipped about 7 per cent of their output into eastern territory, amounting to about 240,000 tons annually. It appears to be a fair statement that the Chicago region today is from 2,000,000 to 3,000,000 tons short of finished steel annually to supply its normal requirements.

Freight rates have definitely marked the dividing barrier, comparatively speaking, between the Chicago and Pittsburgh districts, as a line skirting the western boundary of Michigan and passing through western Ohio from a point just east of Toledo to one west of Cincinnati. Dayton proves to be exactly on the center line, with a rate of 27½ cents per 100 pounds from both Pittsburgh and Chicago.

* * *

WITH the trend of population, industrial development and the general upbuilding of the country, production of steel west of the Chicago-Pittsburgh freight line promises to steadily increase. The abolition of Pittsburgh plus will accelerate this movement. Companies which looked upon western expansion as a logical course for the indefinite future now are faced with taking up this question seriously and actively in order that they may preserve their competitive position. This is particularly true among independent companies. Already some construction programs are under way which clearly were brought to the stage of action at this time through the readjustments which have come to the front with the passing of a single Pittsburgh base.

Chicago District Capacity

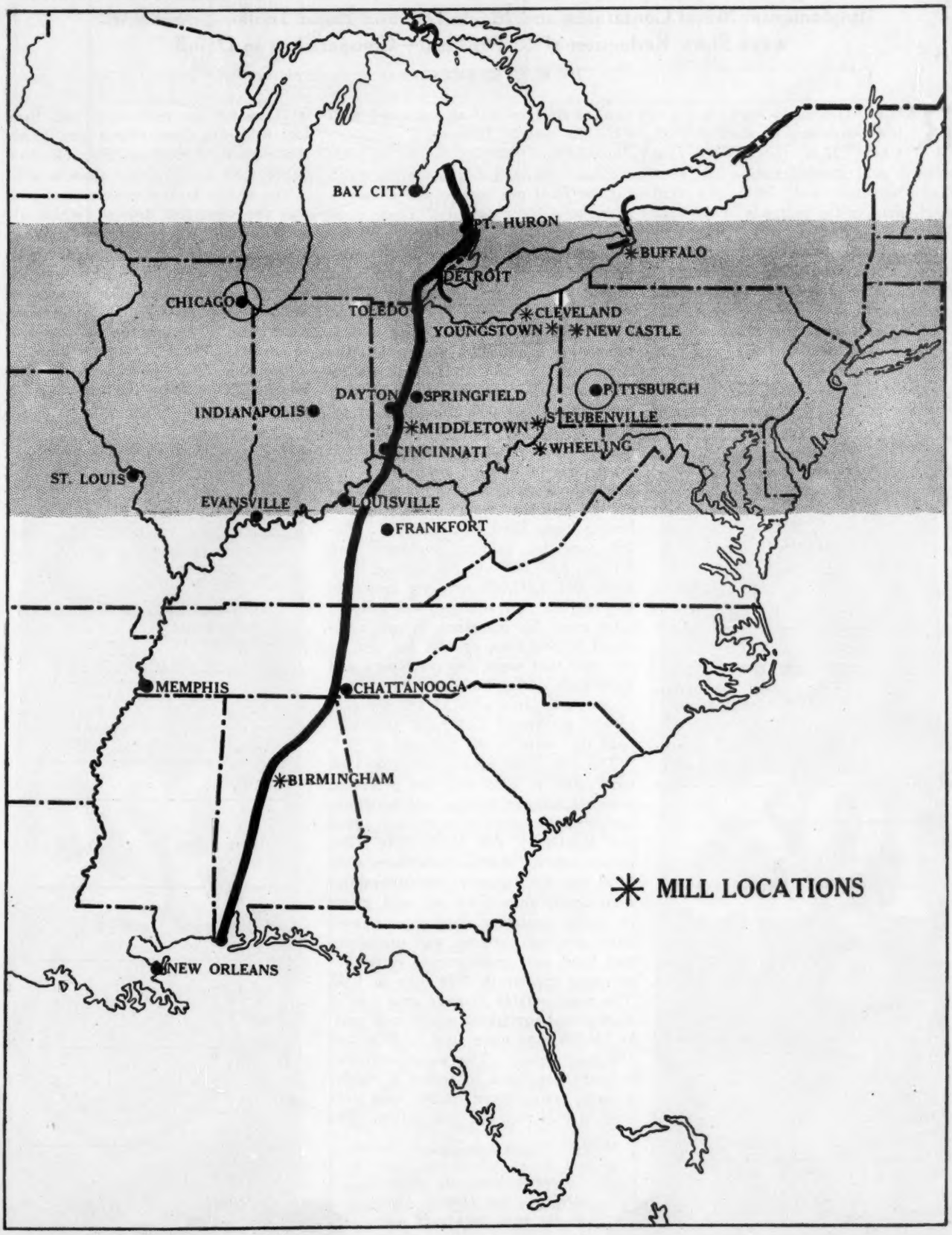
	Pig irn	Steel ingots
1910	5,415,750	4,868,874
1911	5,486,000	4,929,740
1912	5,414,500	5,833,000
1913	5,625,100	5,586,800
1914	5,745,800	5,845,400
1915	5,805,300	5,824,000
1916	5,891,100	6,107,400
1917	6,529,000	7,324,200
1918	7,465,700	7,831,100
1919	7,569,500	8,184,900
1920	7,593,250	8,211,300
1921	7,630,350	8,772,100
1922	7,664,150	8,522,100
1923	7,733,350	8,624,000
1924*	7,831,675	8,860,000

*Estimated.

After all, the welfare of the buyer lies in steelworks capacity which he may tap to advantage and not in basing points. The saving gained by western buyers in being quoted on a Chicago, Gary or Indiana Harbor base today is likely to be neutralized by the tonnage for which they must go outside their district at correspondingly high prices when a big market exists. Such a market seems now in sight.

Until the gap between productive capacity and consumptive power is closed or considerably narrowed, western buyers are not likely to reap the full benefit of their market position. But this process is one that seems likely may only be carried out gradually. Five years seems little enough time within which to expect any appreciable change in the relationship of production and consumption in the Chicago district. In the meantime, as demand ebbs and flows Pittsburgh base or its equivalent will remain a visible or an invisible market factor.

Where Competitive Territory Divides for Pittsburgh and Chicago Mills



BLACK LINE TRACES DIVISION OF COMPETITIVE TERRITORY, BASED ON PRESENT FREIGHT RATES, BETWEEN PITTSBURGH AND CHICAGO MILLS. SHADED AREA SHOWS ZONE OF DENSEST STEEL CONSUMPTION IN THIS COUNTRY

Steel Consumption Is Reduced

All Groups Took Less Finished Material in 1924 Except Railroad Structures, Agricultural Implements, Metal Containers and Machinery and Hand Tools—Street Railways Show Reduction of 48 Per Cent—Comparisons in Detail

BY E. C. KREUTZBERG

RAILROADS again were the heaviest consumers of steel in 1924, taking 27.53 per cent of the finished steel shipped during the year. This compares with 30.43 per cent which went to the railroads in the year 1923.

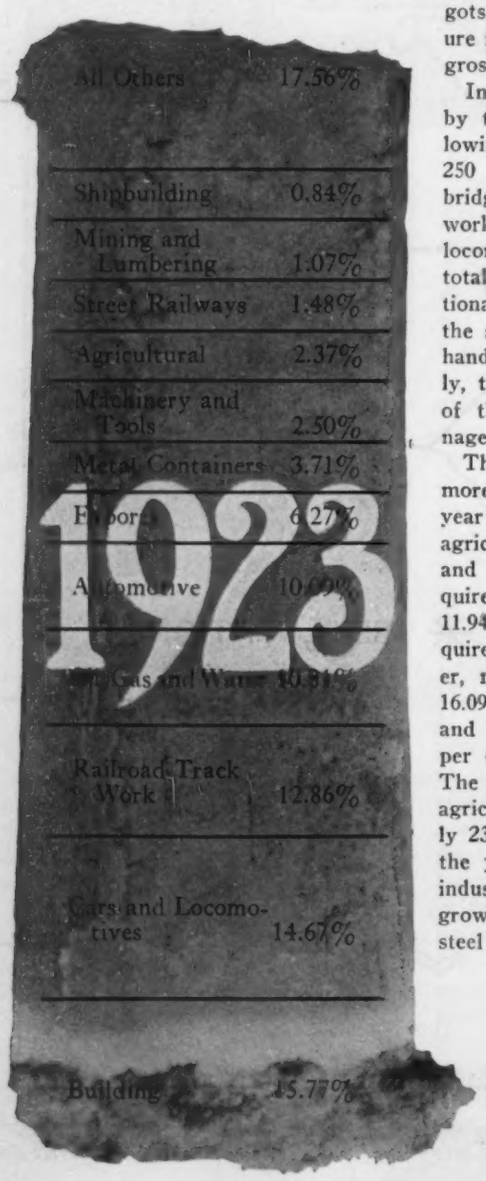
The railroads, however, furnished less of the steel demand, proportionately, in 1924 than the preceding year, for the railroads bought 20.28 per cent less steel in 1924 than in 1923, whereas production of steel in 1924 was only 11.91 per cent less than in 1923. The calculation shows that the railroads took a total of 7,395,800 gross tons of finished steel in 1924 as compared with 9,277,120 tons in 1923.

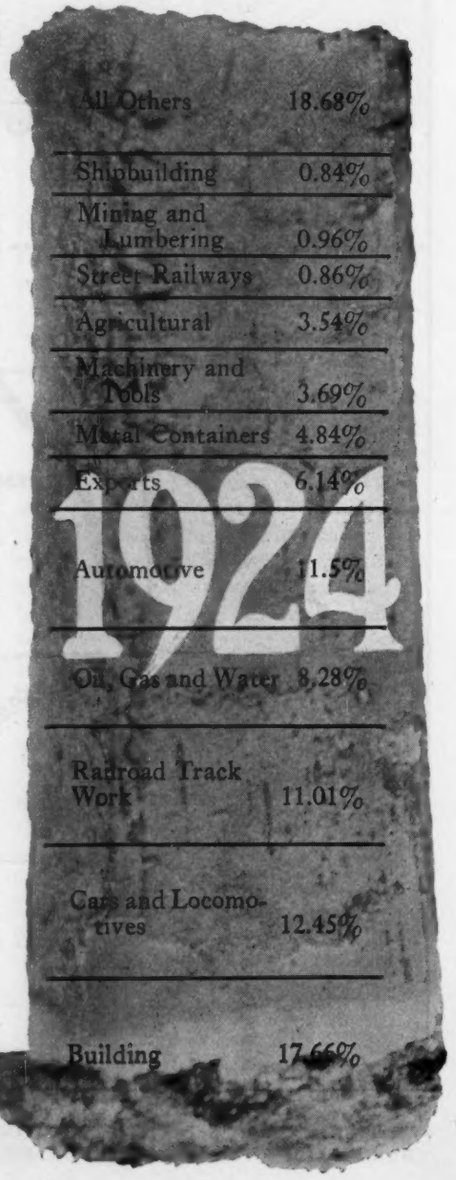
IRON TRADE REVIEW's figures for 1924 are based on reports of companies which control 76.30 per cent of the country's entire steel ingot capacity. These companies reported shipments of 20,496,-107 gross tons of finished steel products during 1924, indicating that the country's total shipments of finished steel in 1924 were 26,862,526 gross tons. The percentage of error in this calculation is probably very small; the American Iron and Steel institute's reports indicate a production of somewhat more than 36,000,000 gross tons of ingots during 1924, the corresponding figure for which would be about 27,000,000 gross tons of finished products.

In estimating total absorption of steel by the railroads during 1924, the following items have been included: 870,-250 tons for railroad buildings and bridges, 2,957,680 tons for railroad track work and 3,345,028 tons for cars and locomotives. In addition, the railroad total must be increased by an additional 222,942 tons, or 22½ per cent of the steel that went into machinery and hand tools during the year. Incidentally, this compares with 33 1/3 per cent of the machinery and hand tool tonnage that went to the railroads in 1923.

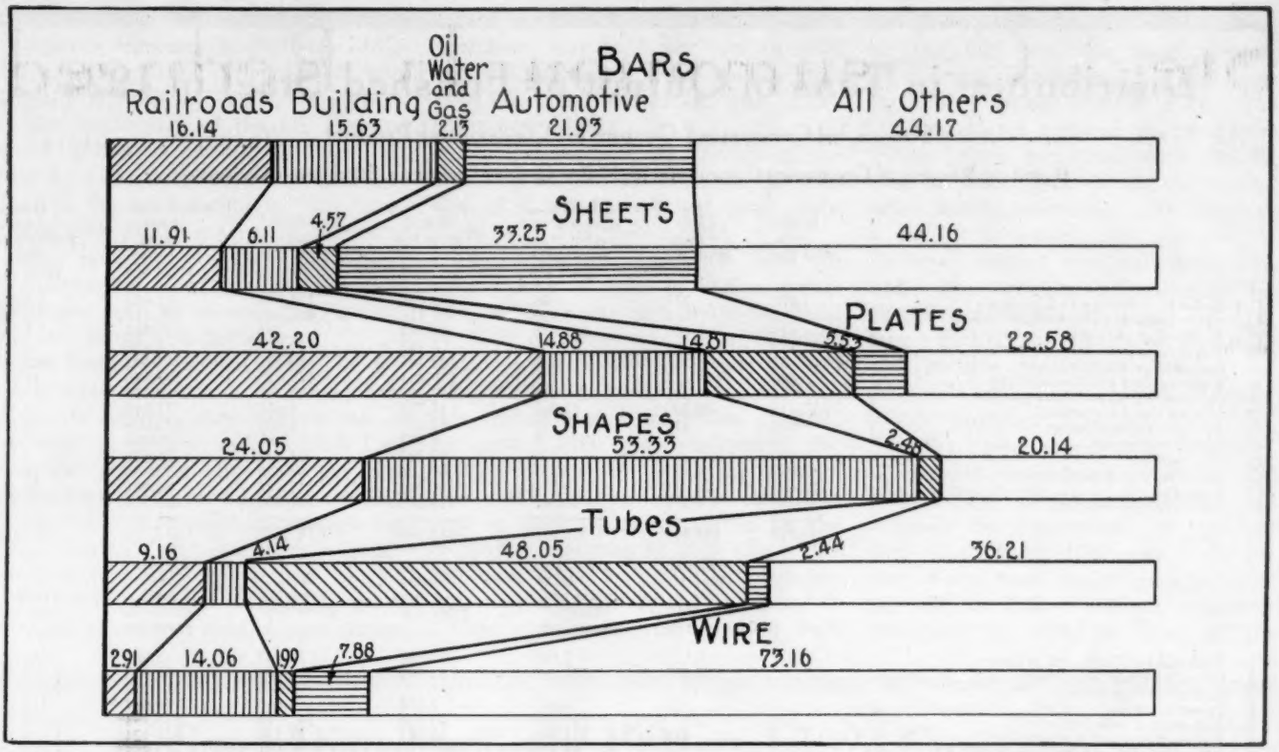
The only consuming groups that took more steel in 1924 than the preceding year are railroad bridges and buildings, agricultural equipment, metal containers and machinery and hand tools. Requirements for railroad structures were 11.94 per cent greater, agricultural requirements were 32.79 per cent greater, metal container requirements were 16.09 per cent greater and machinery and hand tool requirements were 2.34 per cent greater in 1924 than in 1923. The most notable tonnage gain was in agricultural equipment which took nearly 235,000 tons more steel in 1924 than the year before. The metal container industry continued to reflect a regular growth, taking about 180,000 tons more steel in 1924 than the year before. The increase in the machinery and hand tool field was about 88,000 tons. Railroad structural requirements took about 93,000 tons more in 1924 than in 1923.

The second largest consumer of steel was the structural demand, which absorbed 870,250 for railroad buildings and bridges and 3,874,267 tons for other structures. The total structural requirements took 17.66 per cent of all the steel shipped in 1924. This compares with 15.77 per cent of the 1923 shipments. The 1924 total is 4,744,517 gross tons, compared with 4,903,186 tons in 1923. Thus the structural activity compared very well with the





Consumption of finished steel in the United States by the main groups of users is shown by proportionate subdivisions of the ingots, for 1924 and 1923.



HOW LEADING FINISHED STEEL PRODUCTS WERE ABSORBED IN 1924 BY IMPORTANT CONSUMING INDUSTRIES

great volume of 1923. The extent to which railroad structural requirements expanded in 1924 as compared with the drop of 6.10 per cent in other structural requirements is an interesting feature.

Automotive vehicles took 11.05 per cent of all the steel in 1924, or 2,969,491 tons. This showed a drop of only 8.05 per cent from 1923. Thus, despite fears about the automobile industry reaching the saturation point, is shown the great consuming vitality of this industry.

As IRON TRADE REVIEW has been compiling systematically figures on finished steel distribution for four years, it now is possible to give some averages, serving to determine more definitely the relative consuming power of the leading groups. The four-year average shows exports took 8.51 per cent of the total, compared with 6.54 in 1924. General building construction in the four years took 15.29 per cent, in contrast with 17.66 per cent in 1924. The automotive industry averaged 9.98 per cent for four years. The percentage in 1924 for this industry was 11.05.

Railroad cars and locomotives have a four-year average of 11.91, compared with 12.45 in 1924. Railroad track work averages 10.66 per cent. The figure for 1924 was substantially the same, 11.01 per cent. Oil, gas and water interests in four years took 10.42 per cent of the total, as against 8.28 on 1924. Machinery and hand tools average 3.37 per cent; the proportion for 1924 was 3.69. Agricultural implements average 2.99 per cent, while the percentage for 1924 was 3.54.

The year 1924 was a quiet one in the shipbuilding industry, and this is reflected in the amount of steel consumed. The calculated total gross tonnage of steel used in the industry during the past year was 223,904 tons, compared with 254,217 tons in 1923. The reduction amounts to 11.92 per cent.

Demand for finished steel in mining and lumbering also decreased in 1924. This division accounted for 0.96 per cent of the finished steel manufactured in the United States, compared with 1.10 per cent in 1923. The calculated gross tonnage of finished steel consumed by the industry in 1924 was 257,081 tons, compared with 335,945 tons in 1923. This represents a reduction of 23.48 per cent. Actually, those manufacturers reporting in 1924, representing 76.30 per cent of total ingot capacity, shipped 196,153 tons for uses in mining and lumbering. In 1923, the companies representing 73.52 per cent of the ingot capacity, shipped 257,081 tons.

Shipbuilding in general took 0.84 per cent of all the finished steel manufactured in the United States in the year 1924, substantially the same as in 1923, in which year the percentage was 0.83 per cent.

A pronounced reduction in finished steel tonnage consumed is recorded for the country's oil, gas and water interests, in 1924 compared with 1923. Next to the reduction in the amount of steel used by the street railways, this shows the largest proportionate decrease. The drop was 31.19 per cent. This is important because of the fact the oil, gas and water interests are among the largest consuming divisions. In 1923 they took 3346 tons more than the automotive industry. The steel consumption by the automotive industry in 1924 dropped 8.05 per cent from the tonnage of 1923. Despite this fact, the oil, gas and water interests fell behind in 1924, and consumed 745,117 tons less than the automotive industry.

The calculated gross tonnage of finished steel consumed in 1924 for all oil, gas and water purposes was 2,224,374 tons, compared with 3,232,836 tons

Presents Fourth Annual Steel Analysis

THIS is the fourth of the annual articles to be published in IRON TRADE REVIEW *showing the distribution of finished steel in the United States by the principal consuming divisions. The data affords accurate means for determining the relative amounts of finished steel used for various purposes; it becomes more valuable as the record is carried forward from year to year.* IRON TRADE REVIEW *originated this method and was the first to publish in 1922 a complete analysis of steel distribution. That this is appreciated, is indicated by the cooperation given by the leading manufacturers in supplying facts concerning their shipments.*

Distribution in Tons of Output of Finished Steel in 1924

Shown by Consuming Groups and Individual Product

Based on Reports of Companies Controlling 76.30 Per Cent of Country's Steel Ingot Capacity

		Heavy rails, gross ton	Light rails gross ton	Angle bars, steel ties and other track accessories, gross ton	Plates, gross ton	Structural shapes, gross ton	Bars and shapes under 3-inch, gross ton	Hoops, bands and cotton ties, gross ton
1.	Railroad buildings and bridges	1,270	273	66	153,734	224,578	92,460	6,274
2.	Other buildings and bridges	1,081	461	1,529	369,516	1,466,306	508,358	93,286
3.	Railroad track work	1,664,415	3,156	475,816	54,982	393	35,366	1,197
4.	Street railways	71,499	.....	23,039	3,742	1,813	7,130	1,122
5.	Automotive vechicles	31	36	468	137,388	14,151	713,143	368,881
6.	Railroad cars and locomotives	306	3	112	839,241	436,620	397,646	17,096
7.	Oil, gas and water requirements	47	215	183	367,583	68,296	69,116	17,828
8.	Mining and Lumbering	17,115	70,009	12,049	15,773	8,666	11,043	12,326
9.	Agricultural equipment	478	215	99	32,077	8,006	272,008	21,825
10.	Metal containers	5	7	7	3,900	967	1,963	69,345
11.	Shipbuilding	100	.....	28	92,219	34,335	26,816	1,155
12.	Machinery and hand tools	997	1,557	559	69,186	61,819	430,936	20,397
13.	Exports	173,699	18,913	19,870	125,341	112,501	66,802	20,464
14.	All other requirements	28,285	9,239	18,508	218,061	310,928	619,974	259,800
	Totals	1,959,328	104,084	552,333	2,482,743	2,749,379	3,252,760	911,000

		Black plates for tinning, gross ton	All other black plate and sheets, gross ton	Tubing and pipe, gross ton	Wire products gross ton	All other finished steel products, gross ton	Totals, gross ton
1.	Railroad buildings and bridges	.....	1,000	155,000	25,443	3,903	664,001
2.	Other buildings and bridges	13,437	128,190	83,696	254,668	35,538	2,956,066
3.	Railroad track work	.....	.....	.....	7,063	14,322	2,256,710
4.	Street railways	.....	8,043	2,858	5,640	50,647	175,533
5.	Automotive vehicles	.....	703,709	49,376	142,748	135,791	2,265,722
6.	Railroad cars and locomotives	455	251,949	30,382	27,322	551,124	2,552,256
7.	Oil, gas and water requirements	35,994	96,821	972,150	36,101	32,863	1,697,197
8.	Mining and Lumbering	.....	16,331	712	23,712	8,417	196,153
9.	Agricultural equipment	.....	37,261	847	287,196	64,400	724,412
10.	Metal containers	820,731	60,970	2,952	23,318	8,446	992,615
11.	Shipbuilding	.....	3,820	2,431	1,937	7,998	170,839
12.	Machinery and hand tools	.....	73,136	1,577	56,183	39,674	756,020
13.	Exports	126,877	185,511	141,052	164,801	103,417	1,259,248
14.	All other requirements	68,492	549,588	580,078	755,230	411,152	3,829,335
	Totals	1,065,986	2,116,329	2,023,111	1,811,362	1,467,692	20,496,107

Distribution by Percentage of Output of Finished Steel in 1924

Shown by Consuming Groups and by Individual Product

Based on Reports of Companies Controlling 76.30 Per Cent of Country's Steel Ingot Capacity

		Heavy rails, gross ton	Light rails gross ton	Angle bars, steel ties and other track accessories, gross ton	Plates, gross ton	Structural shapes, gross ton	Bars and shapes under 3-inch, gross ton	Hoops, bands and cotton ties, gross ton
1.	Railroad buildings and bridges	0.06	0.26	0.01	6.19	8.17	2.84	0.69
2.	Other buildings and bridges	0.05	0.44	0.28	14.88	53.33	15.63	10.24
3.	Railroad track work	84.95	3.03	86.15	2.21	0.02	1.08	0.13
4.	Street railways	3.65	....	4.17	0.15	0.07	0.22	0.12
5.	Automotive vehicles	....	0.04	0.08	5.53	0.51	21.93	40.49
6.	Railroad cars and locomotives	0.02	....	0.02	33.80	15.88	12.22	1.88
7.	Oil, gas and water requirements	....	0.21	0.03	14.81	2.48	2.13	1.97
8.	Mining and Lumbering	0.87	67.26	2.18	0.64	0.31	0.34	1.35
9.	Agricultural equipment	0.03	0.21	0.02	1.29	0.29	8.36	2.39
10.	Metal containers	....	....	....	0.16	0.04	0.06	7.61
11.	Shipbuilding	0.01	....	0.01	3.72	1.25	0.83	0.13
12.	Machinery and hand tools	0.06	1.50	0.10	2.79	2.25	13.25	2.24
13.	Exports	8.86	18.17	3.60	5.05	4.09	2.05	2.24
14.	All other requirements	1.44	8.88	3.35	8.78	11.31	19.06	28.52
	Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00

		Black plates for tinning, gross ton	All other black plate and sheets, gross ton	Tubing and pipe, gross ton	Wire products gross ton	All other finished steel products, tongross	Totals, gross ton
1.	Railroad buildings and bridges	.....	0.05	7.66	1.40	0.27	3.24
2.	Other buildings and bridges	1.26	6.06	4.14	14.06	2.42	14.42
3.	Railroad track work	....	....	....	0.39	0.98	11.01
4.	Street railways	....	0.38	0.14	0.31	3.45	0.86
5.	Automotive vehicles	....	33.25	2.44	7.88	9.25	11.05
6.	Railroad cars and locomotives	0.04	11.91	1.50	1.51	37.55	12.45
7.	Oil, gas and water requirements	3.37	4.57	48.05	1.99	2.24	8.28
8.	Mining and Lumbering	....	0.77	0.04	1.31	0.57	0.96
9.	Agricultural equipment	....	1.76	0.04	15.86	4.39	3.54
10.	Metal containers	76.99	2.88	0.15	1.29	0.57	4.84
11.	Shipbuilding	....	0.18	0.12	0.11	0.54	0.84
12.	Machinery and hand tools	....	3.46	0.08	3.10	2.70	3.69
13.	Exports	11.91	8.76	6.97	9.10	7.05	6.14
14.	All other requirements	6.43	25.97	28.67	41.69	28.02	18.68
	Totals	100.00	100.00	100.00	100.00	100.00	100.00

in 1923. The distribution by those companies reporting in 1924 was 1,697,197 tons, compared with 2,451,783 tons actually reported by companies in 1923.

The importance of the oil, gas and water group is shown by the fact that as a whole it consumed 8.28 per cent of the total output in 1924, compared with 11.5 per cent for the automotive industry. In 1923 the group's proportion of the total output was 10.60 per cent, as compared with 10.09 for the automotive industry.

The country's export trade in finished steel products in 1924 held substantially to the same proportions of the total as did the trade in 1923. Last year the proportion was 6.14 per cent of the total while in the year preceding it was 6.22. Expressed in tonnage figures, however, the reduction is much more pronounced.

In 1924 the total calculated gross tonnage of finished steel shipped abroad was 1,650,391 tons, compared with 1,896,950 tons in 1923. This was a reduction of 13 per cent. The amount exported by those companies reporting totaled 1,259,248 tons last year compared with 1,438,647 exported by the companies reporting in the year preceding.

The increase in the amount of finished steel consumed in the manufacture of agricultural implements in 1924 was 32.79 per cent over 1923. Makers of farm tools evidently were preparing for the expansion of demand that is believed certain to follow the advance in prices of farm products. The total calculated gross tonnage consumed in 1924 was 949,427 tons, compared with 715,003 tons in 1923. This branch accounted for 3.54 per cent of the total output of finished steel in 1924, and 2.34 per cent of the total in the preceding year.

The increase in the tonnage consumed by the manufacturers of metal containers was 16.09 per cent in 1924, and the calculated gross tonnage was 1,300,937 tons, compared with 1,120,669 tons in 1923.

The manufacture of containers absorbed 4.84 per cent of the production of finished steel last year, compared with 3.68 tons in 1923.

The automotive industry took 2,969,491 tons of steel in 1924 a reduction of 8.05 per cent from the total of 3,229,490 tons in 1923. Railroad track work took 2,957,680 tons in 1924 compared with 3,838,569 tons in 1923, this representing a reduction of 22.95 per cent. This group accounted for 11.01 per cent of the total production last year, as against 12.59 per cent in 1923. Tonnage placed by the companies reporting in 1924 was 2,256,710 tons, while in 1923 the companies reporting shipped 2,911,171 tons.

Cars and locomotives in 1924 took 3,345,028 tons, compared with 4,393,517 tons in 1923, a reduction of 23.86 per cent. This division accounts for 12.45 per cent of the total finished steel output of 1924. In 1923 it took 14.41 per cent of the total.

Street railways, one of the least important of the finished steel consuming groups, shows the largest reduction in the tonnage consumed in 1924. The drop amounted to 48.85 per cent. The calculated total gross tonnage taken in 1924 was only 230,056 tons, compared with 449,723 tons in 1923. The great decrease is believed to be due largely to the extent to which automotive vehicles have supplemented or supplanted street railway service. Street railways in 1924 absorbed only 0.86 per cent of the country's total, while in the year preceding they took 1.47 per cent of the total.

The improvement in the machinery and hand tool industry is evidenced by the fact that the manufacturers as a group increased their steel consumption 2.34 per cent in 1924. The total calculated tonnage absorbed was 990,852 tons, compared with 802,887 tons in 1923. One of the interesting facts noted concerning this industry is that it consumed 3.69 per cent of the total finished steel output in 1924, while the agricultural equipment industry accounted for only 3.54 per cent. In 1923 the machinery and hand tool division took 2.63 per cent of the total, while farm equipment manufacture absorbed 2.34 per cent.

In the group representing buildings, which includes railroad buildings and bridges, and all other buildings and bridges, the absorption of finished steel products in 1924 was 17.66 per cent of the total, compared with 16.08 per cent in 1923. Railroad structures accounted for 3.24 per cent of the total last year, an increase from 2.55 per cent in 1923.

The tonnage consumed in the railroad structures increased 11.94 per cent, from 777,405 tons in 1923 to 870,250 tons in 1924. The tonnage accounted for by all other structures was reduced 6.10 per cent, from 4,125,781 tons in 1924 to 3,874,267 tons in 1923. Considering the fact this group took 14.42 per cent of the total finished steel output in 1924, the reduction in tonnage was relatively small. It amounted only to 251,514 tons.

The amount of finished steel consumed by all manufacturers unclassified and contained in the general group "All ather requirements" was 5,018,788 tons in 1924, compared with 5,322,889 tons in 1923, a reduction of 5.71 per cent. This division accounts for 18.68 per cent of the total consumption, while in 1923 the proportion was 17.46 per cent of the total.

Steel Distribution in 1923 and 1924 Compared

	Consuming Classification	Distribution Percentages for 1924	Distribution percentages for 1923	Gross tonnage distribution of companies reporting for 1924	Gross tonage distribution of companies reporting for 1923	Calculated gross tonnage distribution of all companies for 1924	Calculated gross tonnage distribution of all companies for 1923	Percentage of increase or decrease of consumption in 1924 compared with 1923
1.	Railroad buildings and bridges	3.24	2.55	664,001	589,584	870,250	777,405	+ 11.94
2.	Other buildings and bridges	14.42	15.53	2,956,066	3,128,992	3,874,267	4,125,781	— 6.10
3.	Railroad track work	11.01	12.59	2,256,710	2,911,171	2,957,680	3,838,569	— 22.95
4.	Street railways	0.86	1.47	175,533	341,070	230,056	449,723	— 48.85
5.	Automotive vehicles	11.05	10.59	2,265,722	2,449,245	2,969,491	3,229,490	— 8.05
6.	Railroad cars and locomotives	12.45	14.41	2,552,256	3,332,043	3,345,028	4,393,517	— 23.86
7.	Oil, gas and water requirements	8.28	10.60	1,697,197	2,451,783	2,224,374	3,232,836	— 31.19
8.	Mining and Lumbering	0.96	1.10	196,153	254,781	257,081	335,945	— 23.48
9.	Agricultural equipment	3.54	2.34	724,412	542,258	949,427	715,003	+ 32.79
10.	Metal containers	4.84	3.68	992,615	849,915	1,300,937	1,120,669	+ 16.09
11.	Shipbuilding	0.84	0.83	170,839	192,798	223,904	254,217	— 11.92
12.	Machinery and hand tools	3.69	2.63	756,020	608,910	990,852	802,887	+ 2.34
13.	Exports	6.14	6.22	1,259,248	1,438,647	1,650,391	1,896,950	— 13.00
14.	All other requirements	18.68	17.46	3,829,335	4,036,879	5,018,788	5,322,889	— 5.71
	Totals	100.00	100.00	20,496,107	23,128,076	26,862,526	30,495,881	— 11.91
	Total all railroad	27.53	30.43	5,643,072	7,035,768	7,395,900	9,277,120	— 20.28

Record Steel Needs Indicated

All Important Channels of Normal Consumption Present Unusually Promising Outlook for 1925, As Analyzed by Industrial Authorities—Unusual Combination of Favorable Underlying Factors Is Shown

DEMANDS for iron and steel in 1925 bid fair to equal or exceed in total any record of the past.

This is the composite figure drawn from the views and forecasts of ranking authorities in each of these fields of industry, the needs of which furnish the foundation for iron and steel demand and production.

According to the annual statistics of steel distribution compiled by IRON TRADE REVIEW, the groups represented by the railroads, building construction, automotive and oil, water and gas activities, normally account for two-thirds of the output of the mills and furnaces. All indications based on definite and substantial grounds, point that the combined requirements of these groups in 1925, will be much in excess of 1924 and probably will go beyond 1923 when more finished steel was consumed by this country than in any other year in history. It is possible, the authorities say, from the present outlook, that these four classifications may require a total in excess of 15,000,000 tons.

Other activities such as the use of metal containers, the building of machinery and hand tools, the agricultural pursuits, mining and lumbering, exporting, etc., without exception, present prospects where a much increased demand for steel over the past several years is a reasonable if not an assured probability.

Summed up, it is doubtful whether any single year within the present generation could marshall at its beginning, such uniformly bright prospects in all those main channels of normal steel consumption as 1925.

General Industrial Outlook Points to Prosperity

New Business Cycle Beginning

BY THE soundness, accuracy and lucidity of his forecasts, Col. L. P. Ayres has won international recognition as the "high priest" of practical business economists.

IN RECENT years the business world has become familiar with the term "business cycle," and it has learned to use it in referring to the swings of general business that recur every three or four years, and carry commerce, trade, and industry from depression up to recovery, on up to prosperity, down again to decline, and finally to another depression.

The most important fact in the present business situation is that we have recently entered a new business cycle in this country. The old one that began in the depression of 1921 came to an end last summer, and a new one is under way.

It is extremely significant that this new business cycle starts off with the same combination of conditions that has existed at the beginning of some of the most notable periods of sustained prosperity in earlier years. It has long been noted that four factors are necessary to produce a period of sustained prosperity in this country. The first is increasing industrial production after a period of depression. The second is good agricultural prices. The third is increasing export demand, and the fourth is easy credit conditions.

These four controlling factors came together in combination at the beginning of the record-breaking period of prosperity which began in 1899, and lasted until 1903. They were again present in the so-called Roosevelt prosperity from 1904 through 1907. They were again present during the unprecedented prosperity that lasted from 1915 until the spring of 1920. It is noteworthy that they were not all present during the relatively short prosperity that began late in 1922, and subsided early in 1923.

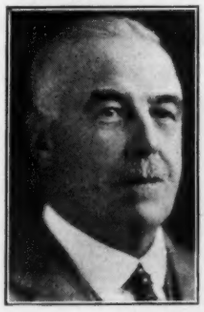
The present prospects are that the trend of general business will be upward in 1925. Interest rates will probably be relatively low, but will move upward during the year. Stock prices promise to move forward irregularly to new high levels next year, but to reach their highest points and turn down during the year. Building construction will probably go ahead in large, but not record-breaking volume, and there is little likelihood of a reappearance of the recent bonuses added to wages in the building trades.

There promises to be less unemployment in 1925, and the course of wages will probably be upward. The cost of living will probably increase. Traffic on the Great Lakes and coastwise traffic will probably be better and more profitable than in 1924. The coming year promises

to be a better year for sellers than for buyers, and profit margins should increase.

The output of iron and steel will in all likelihood be much greater in 1925 than it was in 1924. The present prospects are that sometime during the coming 12 months new high records for the rate of pig iron production will be established. Moreover it seems likely that iron and steel production will be sufficiently well maintained to call for lake shipments of iron ore of about 50 per cent greater than during 1924, or a total in excess of 60,000,000 tons. The production of trucks and automobiles should reach a total of about 3,600,000.

In conclusion, it is probable that 1925 will be a year of business recovery, reaching prosperity, with greater industrial production, and larger net earnings, and it is likely that these developments will be accompanied by more speculation in both commodities and securities. The year promises to be one of increasing business acceleration, approaching the speed limit, and in danger of incurring the consequent penalties in 1926.



SO MUCH importance attaches to railroad buying that the bright picture drawn by R. H. Aishton, president of the American Railway association, is most gratifying.

Heavy Buying by Railroads Will Be Continued

Capital Outlay Greatest in 1924

CAPITAL expenditures for additions and improvements to railway property authorized in 1924 by the Class I railways of the United States, were the greatest for any similar period in history, amounting to $1,077,297,000.

Of that amount, $610,904,000 was actually expended up to Oct. 1, 1924. Since that date additions and improvements have continued to be under way but it is impossible just now to estimate what the capital expenditures actually made for the year will total.

Present indications look to a continuation during the coming year of the heavy freight traffic which the railroads successfully handled without transportation difficulties in 1923 and 1924. Until some line can be obtained as to traffic indications in 1925, however, it will be impossible to say what capital expenditures will be that year.

Capital expenditures authorized in 1924 for equipment alone totaled $513,497,000, of which amount $346,091,000 was actually expended up to Oct. 1. Capital expenditures for equipment by classes follow:

	Authorizations	Actual expenditures up to Oct. 1, 1924
Locomotives	$101,233,000	$ 66,650,000
Freight train cars	322,940,000	229,027,000
Passenger train cars	69,327,000	37,382,000
Other equipment	69,997,000	13,032,000

Class I railroads in 1924 also authorized the expenditure of $563,800,000 for roadway and structures. Reports for the first nine months showed the actual expenditure for that purpose to have been $264,813,000.

For additional track including rail and tie fastenings and other track material, the amount of authorized expenditure during the year just passed was $179,345,000, while for heavier rails the amount was $36,248,000. For shops and engine houses, it amounted to $51,890,000.

The railroads did not install as many freight cars in 1924 as during the previous year, but they did continue the policy of placing in service additional cars in order to continue to provide adequate transportation service. While the number was less, the capacity of the cars was somewhat greater than those of the previous year, as was also the case in respect to tractive power of locomotives. Reports for the year are not complete, but freight cars installed during the ten-months period totaled 137,369 while for locomotives the total was 1770. These figures include new, rebuilt and leased equipment.

ROBERT F. BINKERD as vice president of the public relations committee of the Eastern railroads is chief spokesman for the railroads on economic and other public matters.

High Water Mark in Traffic Is Predicted for 1925

At Least 150,000 New Cars Needed

PROBABLY 1925 will see a new high water mark in railway traffic. The adoption of the Dawes plan ought to provide a market for greater exports of raw material from this country. In domestic consumption, the increase in the prices of farm products is restoring the purchasing power of our 30 million or more of our people who live on the farms. In the past this has always been a prelude to a series of years of good business. By reason of the better distribution of the national income to both farmers and railroads, there ought to be good business in 1925.

This traffic ought to carry the railroads closer to a fair return, not only upon the value of the railroad plant as it stood in 1920, but upon the more than 3 billion of new investment made since that time, which as yet has had no return.

The railroads themselves will make a big contribution to good business by capital expenditures which will probably equal those of 1924 or 1923, and by adequate standards of maintenance and op-

ervation. It is believed rehabilitation of the freight car supply—meaning by that making up for the insufficient retirements of old cars in previous year—will be about completed at the end of this year. This would still leave in prospect, however, something like 100,000 new cars each year to take the place of cars retired, and somewhere between 50,000 and 75,000 cars each year to take care of the growth of population and traffic. With regard to this latter, however, there is some difference of opinion, as it is perhaps not yet possible to estimate the effect of the new and higher standards of car use upon the requirements for additional cars to meet the normal growth of traffic.

The pressure to distribute the unit costs of operating a train over a greater trainload bids fair to open up a new era in developing more powerful locomotives. Progress along this line will be signalized, however, not so much in the number as in the character of locomotives.

The remarkable efficiency of the railroad industry has always consisted in increasing the volume of transportation without equal increases in tools, investment or operating expenses. Therefore, in general, every effort will be made to haul the greater traffic of the future with as small an addition to the number of cars and locomotives as possible.

There will apparently be more new construction underway during 1925 than in any year since 1916. For the first time since that year there is in prospect an increase in the total main line mileage.

Automotive Industry's Demands May Surpass 1923 Mark

Steel Needs at Least 3,000,000 Tons

AMONG the gifts possessed by Edward S. Jordan is that of prophetic vision. His views always command widespread respect. He is president of the Jordan Motor Car Co.

THE steel requirements of the automobile industry for 1925 will certainly not be under 3,000,000 tons, and it is more likely that the requirements will exceed the consumption of 1923 when a total of 3,434,800 tons was consumed.

In the 25 years of the business, automobile production has receded from the previous year's record but three times—once in 1918, a war year; 25 per cent off in 1921, a year of postwar depression; while the year 1924 will probably show about 12 per cent off when all the production reports are completed. During 1923 more than 4,000,000 cars and trucks were manufactured, while production in 1924 will total about 3,500,000 vehicles.

There is an excellent reason for the recession during 1918 and 1921, while in 1924 the curtailment of production was largely due to the introduction of new models with the consequent delays in factory operation. These new models involved the introduction of such new equipment as balloon tires, four-wheel brakes and the gradual development of enclosed car capacity to take care of a change in demand. Then too, the excessive production of the early part of the year embarrassed dealers in such a way that normal sales were retarded.

The close of 1924 will find the dealers with low stocks on hand, much lighter than last year, and with a better outlook for business.

The growing prosperity of the country with the farm situation greatly improved and the export demand developing, it is safe to estimate that the production in 1925 will be near 1923.

Exports of automobiles for the first nine months of 1924 were $166,667,971, which is only about $4,000,000 short of exports for the entire year of 1923. While the monthly average of exports in 1923 was just over $14,000,000, the monthly average for the first nine months of 1924 was close to $18,500,000.

Nor is the question entirely one of production.

There is an increasing use of metal in automobile production. Steel bodies, steel windshield posts, drums on four-wheel brakes and the growing popularity of steel wheels are among the trends in design which are making the automobile industry an increasingly important factor in the steel market.

While the number of companies producing the output will gradually decrease, the outputs of the stronger companies will increase normally with the prosperity of general business.

Prospects for Machine Tools Are Growing Brighter

War Supplies Well Liquidated

ERNEST DUBRUL, general manager of the National Machine Tool Builders' association is widely known as a business analyst. He has always shown a broad grasp of fundamentals.

IT IS natural that inquiries for machine tools should forecast orders. All reports from the field indicate considerable active inquiry which should develop into orders after inventory taking is out of the way in January.

In the course of the average business cycle it is natural that cheap money should stimulate activity. The recent period of cheap money should now be having this effect in a more normal way than the machine tool industry has experienced since 1920.

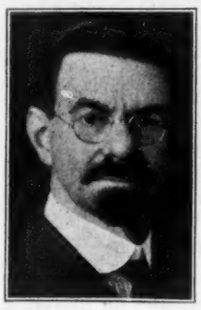
The depression of 1921 was exceedingly severe in the industry, and has continued to a considerable extent ever since, relieved, however, by some active demand in the early part of 1923. A great deal of the demand the industry would normally have experienced in 1923 was supplied by secondhand tools that came out of war shops. Field reports indicate the secondhand market to have very many less machine tools

to offer at this time than in 1922 and 1923, and this should naturally leave more of a field for new tools. In the meantime, the machine tool builders have been busy improving their designs, so that tools made during the war are in very many cases quite obsolete at this time, and new demand will naturally come to the better types of machines now available.

The industry is still suffering from the lack of foresight on the part of large buyers of machine tools who defer their purchases until the very worst part of the business cycle. They wait until they have swept up the labor market themselves, and then expect the machine tool builder to go out and find ways and means of producing machine tools with the same mechanics. It is well known that this policy of deferring equipment purchases until the last minute throws a heavy peak load on the machine tool industry.

This method of buying tools naturally increases the cost of machines produced at that time, compared to those that could be produced in periods of depression, when labor is available and efficient, and when material is cheap. The result is that the machine tool industry has always to carry plant equipment sufficiently large to meet a peak demand, and the users of machine tools have to pay for long periods of idleness of that peak load equipment.

It is astonishing that more large industries do not anticipate their wants for machine tools, and order them at a time when they can be produced at better advantage than the present methods permit.



FRANK E. GORRELL, secretary-treasurer of the National Canners' association, is an authority on the food packing industry. The association embraces 70 per cent of the output.

Needs of Canning Industry Are Steadily Increasing

More Than 1,500,000 Tons Is Normal

WHILE, compared with the railroad or building industries, the canning industry is not a large consumer of steel products, still the preservation of food is a matter of interest to everyone, and the total amount of steel used in the canning of foods is very large.

Based on the average pack for the preceding four years, the figures for the 1924 pack not yet being available, the industry used annually 4,500,000,000 cans for what are generally known as canned foods, packed in hermetically sealed containers.

It requires about 750,000 tons of finished steel and 13,000 tons of pig tin to make the tin plate from which this number of cans is manufactured. Assuming that 50 per cent of these canned foods is shipped in wooden boxes, it would require 5000 tons of box nails to manufacture the shipping containers for these goods.

We are informed upon good authority that approximately an equal amount of steel products is used in the packing of other food products in tin containers, so that the grand total of steel products used for food containers is approximately 1,510,000 tons annually.

From a small beginning in 1820, the commercial canning industry of the United States, which at that time was on a scale comparable to the present day home-canning, has increased not only in volume to the total above mentioned, but has added varieties of products until the number now exceeds 200. This increase in production has been made possible by the wonderful development of machinery and appliances for preparation and canning of the various commodities. The demand is steadily increasing and the output is keeping pace accordingly, except that there is a variation in production depending upon weather and crop conditions.

J. L. KIMBROUGH in portraying the building outlook for 1925, speaks for the organized steel fabricators, as president of the American Institute of Steel Construction.

New Record Year Foreshadowed in Structural Steel

Minimum of 2,500,000 Tons Indicated

THROUGH sources available to the American Institute of Steel Construction, I have estimated an increase of 25 per cent in the tonnage of structural steel consumed in 1925 as compared to 1924. The bureau of census supplies the only dependable statistics and assuming that November and December requirements will equal the totals of the same months in 1923, the volume consumed in 1924 would amount to approximately 1,966,585 tons. The coming year should total a minimum of 2,458,231 tons.

This prediction is based upon economic conditions which point to one of the most substantial periods of prosperity this country ever has known.

The outcome of the recent election will undoubtedly invite a program of expansion on the part of the railroads, public utility organizations and municipalities, which will include steel bridges and buildings.

Building statistics assure a record in 1925 fully the equal of the high mark of 1924. A survey of the United States by *Building Age* of New York, indicates a building shortage that will total well towards the $10,000,000,000-mark. The high total of building permits indicates a new record of winter construction, which would stabilize the building industry throughout the year with definite economies to owners. The contractor members of the New York Building Congress report actual contracts amounting to $30,000,000, a large percentage of which is of a commer-

cial type definitely scheduled for winter work. Architect members report an additional valuation of $25,000,000 of construction work to be let in the near future, making a total reported amount of winter work through these sources, which can be reasonably expected to be undertaken during the winter months of $45,000,000 to $55,000,000 in the city of New York and the immediate vicinity.

Winter work seems to be an accomplished fact and the structural steel industry will profit through such a program. The reconstruction of our commercial centers in our larger cities, where the obsolete building must give way to the modern skyscraper of steel-frame to keep pace with the demands of invested capital, is constantly requiring a larger production of structural steel.

With an eye to the future, the American Institute of Steel Construction is concerned in the possibilities of exploiting new markets and new uses as a means of increasing the tonnage of structural steel to be produced by the fabricating industry. There are some in the industry who have expressed opinions that a principal problem lies in plant capacities that exceed demands by nearly 33 1/3 per cent. The majority, however, are optimistic in their belief that through more intensive cultivation of the market, the development of new uses, greater efficiency in production and selling and through economies of standardization, that co-operative effort under the leadership of the institute will result in an increased volume of business that will far exceed the present plant capacities.

Steel beams and girders unquestionably will find an extended use in a type of floor construction that will combine metal lath and cement. Nearly 85 per cent of the fire loss has its origin in basements and this great national loss could be reduced to the minimum or entirely eliminated through the general adoption of such a specification. In congested districts alone and for apartment and residential buildings, it is an economic necessity.

Recently President Coolidge sounded a note of warning against the appalling waste of our timber resources. "Expressed roughly," he stated, "we have left about 745,000,000,000 cubic feet of timber. From this, the annual drain is 25,000,000,000 cubic feet. This total drain is most significant when we reflect that, towards offsetting it, we have an annual timber growth of only 6,000,000,000 cubic feet, and even in our young forests, where this growth is taking place, cutting has already outstripped growth." Wharton Clay, a prominent Chicago architect, stated before the International Fire Prevention Congress, that apartment or residence buildings with lumber joists, studs and ordinary lath were firetraps.

A greater use of steel and other fire-resisting materials is a partial answer to the question of forest conservation. It meets the demand of fireproof construction. As lumber advances in price and the cost of steel beams and girders is reduced through increased volume and greater efficiency in production, there should be every inducement for co-operation between the structural steel, metal lath and cement producers. The specification is sound and practical. Education and well directed promotional effort would soon establish this type of floor construction as standard. Once adopted, the requirements of steel, cement and metal lath for floor construction would call for double the present capacities of these three products.

Structural steel for the frame work of garages and innumerable other practical uses around farms and in residences offers opportunities for extended uses, which would develop increased tonnage. Structural shapes used in portable residence construction in combination with asbestos blocks shipped in parts and assembled on a concrete foundation have been found practical and economical. An all steel building has been developed in England and successfully used. It has been sold for $1500, contains four rooms and found entirely satisfactory. The perfection of portable steel houses in this country would help solve an acute social problem, afford good homes to those who cannot afford the higher prices.

The execution of a program to develop new markets, new uses; the adoption of the standard specifications, the code of standard practice, as promoted by the American Institute of Steel Construction unquestionably will exert an effective influence on the future use of structural steel in a greater volume and open the way for the development of the industry on a broad policy of expansion.

Agricultural Equipment Turns After Long Depression

Farmer's Position Greatly Improved

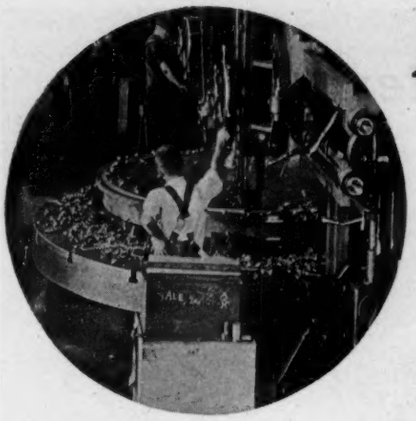
FINLEY P. MOUNT, president of the National Association of Farm Equipment Manufacturers, sees a much better year in 1925 for the recently harassed implement industry.

THE farm machinery business is distinctly better both in actuality and prospect. There is evidence of better demand and larger sales in 1925.

But there is no warrant for the conclusion that 1925 will show a return to normal volume. The farmer's condition is much better than it has been for four years, but his load was so heavy, it will require another crop carrying some profit to restore his normal purchasing ability. The past year with its sudden increase of income in the wheat-growing territory has been one of liquidation. The farmer will not again become a normal purchaser until his debts are reduced to easy control. It is our judgment, it will take a portion at least of another good crop at reasonable prices to put him in this position.

Upon these premises we should say the demand for steel and iron in the farm machinery industry should show some improvement next year. There appears to be no heavy stocks in inventory and a reasonable increase in machinery volume should be reflected in raw material purchases. There should not be and doubtless will not be heavy advance buying of raw materials.

The farm machinery manufacturer does not want to speculate in raw materials and should not be required to do so. The capacity of our supplying sources and our present efficient transportation system should make it unnceessary. He will be shy on a runaway market and his daily prayer will be for stability.



Rivalry Spurs Progress in Engineering

MANUFACTURERS are writing a new chapter in the interesting romance of American industry. It is based on a keen rivalry among the advocates of various methods of fabrication and assembly, who are competing for their share of business in metal products.

Proponents of welding, with the help of their allies, the manufacturers of pressed metal products, are challenging foundrymen. Welded stampings, they insist, are better and cheaper for certain purposes than castings. In the meanwhile, the founders are engaged in active rivalry among themselves. The producers of malleable are directing an attack against gray iron castings, while the steel foundrymen continue their efforts to make inroads on the province of forgings. Makers of electric castings are following up the advantages of their method, especially in regard to alloy steel to specified analyses.

While repelling advances from competitors, gray iron melters are shifting their attention to the use of permanent molds, the centrifugal process and die casting—all of which offer promise of strengthening the competitive position of gray iron establishments.

Not satisfied with their campaign against castings, the welding enthusiasts are seeking entry into the structural field. Just how far welding will encroach on the traditional premises of welding still is to be determined, although 1924 furnished many new illustrations of the spread of welding to the fabrication of containers, small structures, pipe lines and numerous articles previously assembled by bolts, rivets or mechanical seaming.

These are only a few of the struggles for adjustment going on quietly in the metalworking industries. It is this search for methods of improving the quality or reducing the cost of finished articles that is inspiring scientific development to a higher pitch than has been attained at any time since the end of the great war. Engineering progress, in its broader aspects, has been unusually responsive to this motive in 1924. Every operation, from the mining of ore and coal to the machining of the finished piece, is marked by a restless spirit of competition—a striving for something more efficient, more economical and more easily marketed.

In the mining of ore, this progress takes the form of improvements in power generation and distribution, many mining properties having been electrified during the past year. In transporting iron ore, the latest development is the use of diesel engines on the two new lake carriers of the Ford Motor Co. The handling problem in connection with the rail haul of ore and coal constantly is involving heavier units. Cars of 120-ton capacity are in service and those of 150 tons are in imminent prospect. Already car dumpers for the former size are in operation.

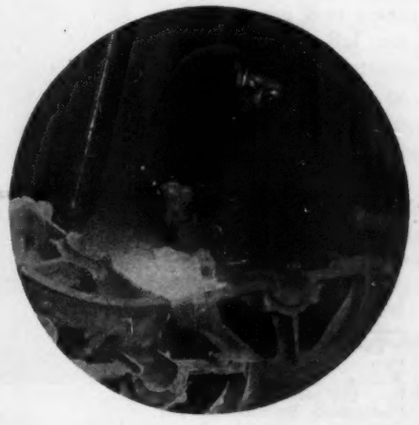
Aside from improving blast furnace practice by paying more attention to what goes into the stack, ironmakers took advantage of the mid-year lull to overhaul many furnace plants and to replace obsolete equipment. Their campaign for clean coal is bearing fruit, and coal operators are beginning to recognize the justice of basing prices on ash content as well as analysis.

The tendency toward the installation of small batteries of by-product coke ovens continues, and the problem of coking other than the easily carbonized fuel was again solved when the Provo ovens successfully handled the so-called "non-coking" western bituminous. The success of the Becker-type retort, developed less than two years ago, is indicated by the fact that with one exception, the new batteries laid down in 1924 were of this design.

Steelmakers are devoting particular attention to fuel efficiency, not only in melting units but more especially in heating furnaces, soaking pits, and power houses. The drives of a score or more mills were modernized during the year. In the manufacture of automobile sheets the trend toward loose rolling is almost universal. Electric roll heaters and mechanical doublers now are found in many sheet plants.

In the general field of metalworking, material handling is fast gaining recognition as a major factor in economical production. In practically every new heat treating plant, foundry, machine shop and manufacturing establishment built in 1924, mechanical devices for minimizing manual labor were outstanding features.

Judged by any criterion, 1924 was an eventful year in engineering. In brief it was a period of rehabilitation of inadequate equipment and unsatisfactory processes.



Furnace Operators Seek Better Materials

IMPROVED blast furnace practice and greater care in the selection of raw materials stand out as the predominant tendencies in the iron making industry in 1924. No important new equipment was developed nor did any remarkable change in blast furnace construction take place. As was the case in 1923, a number of antiquated stacks were abandoned and scrapped, and a few were rebuilt to eliminate most of the hand labor. Improvements in blast-furnace accessories were along the line of more economical use of waste gas at stoves and boilers, the dry cleaning of gas, and prolonging the life of firebrick linings.

During the first quarter of the year, the furnace production increased until the output for the month of March was almost at record tonnage. The month of August saw the other extreme with many idle furnaces. The depression was not without its advantages for it was a time of greater economy and more pig iron per man. Some forehanded managers took advantage of the lull and put their plants in good condition so as to get the benefits of the return to higher prices and profits. The intense campaign for accident prevention and the education and training of employes in classes for "safety first" has brought about a most desirable reduction in the number of "lost time" accidents at blast furnaces. Executives and employes have worked together to eliminate the former hazards around blast furnaces. Construction engineers and safety engineers already had done much to prevent accidents and to make the blast furnace and accessories strong enough to stand the shocks and strains, but that was not sufficient to prevent employes from being hurt. Safety guards and safety rules are necessary, but they cannot prevent harm to careless people. The men themselves must have the safety habit; and the management must see that they get the proper instruction.

Blast furnace plants now are much safer than the streets and highways over which their employes must pass to and from their work. Blast furnace employes are safer than the same number of farmers. It is no longer unusual for blast furnace plants to run one or more months without any lost time accidents.

The research work of the United States bureau of mines and of individuals conducted during the past two years in small experimental furnaces and also at larger furnaces in full operation, has brought good results in the way of better blast furnace practice and a better understanding of blast furnace phenomena. However, no one has yet found a better way of extracting iron from its ores than by having "a descending column of ore, coke and limestone meet an ascending column of gases" inside a vertical furnace in the form of properly proportioned truncated cones and cylinders. The progress in blast furnace practice during the yast year has been in the direction of having the descending column of solids descend more evenly and faster, thus getting a smoother movement of the stock inside the furnace and, consequently, more tons of pig iron per day, per stack, and per man. The character of the coke has more to do with the smooth running of the furnace than any one factor, but the "right kind of coke" must be handled in the right way

VIEW AT FACE OF A COAL MINE IN KENTUCKY

The author is assistant to vice president, American Rolling Mill Co., Columbus, O., and vice president, Portsmouth By-Product Coke Co.

else there soon will be as much sticking and slipping as there is with "poor coke." The tendency of the practice of the past year has been to get more units of iron and more units of carbon per unit volume of materials charged into the furnace. In other words the ore mixture has been enriched and the coke quality improved. At the same time the tendency has been to put this unit volume of materials through the furnace in less time than was formerly thought possible. This does not mean that furnacemen are "over-blowing" their furnaces; it is an evidence of fewer interruptions of the downward movement of solid materials and fewer interruptions of the upward movement of the hot gases inside the iron blast furnace.

"Slips" no longer are to be considered a normal part of blast furnace operation, even with a large proportion of fine ores.

In connection with the more rapid movement of stock through the blast furnace, there are indications that the research work of 1924 will bring us to the conclusion that the chemical reactions in the tuyere zone, especially those relating to carbon are practically instantaneous. The final touches to the quality of the pig iron seem to be given in the very short space of time necessary for the iron and slag to pass downward through the restricted volumes of the combustion zones in front of the tuyeres. Of course, it is necessary to properly burden the furnace in order to get the desired kind of iron as far as most of the analysis is concerned, but it is in this short space of time and distance that the final additions of carbon and the final subtractions of sulphur are made. The blast furnace investigators of the United States bureau of mines have made good progress in 1924 in the study of the reactions in the tuyere zone, but they are still at variance with most practical blast furnace men as to what is meant by the "combustibility of coke." Most of us consider that a coke has good "combustibility" if it passes through this combustion zone quickly and easily.

Complexities of Quality

Along with the progress in malleable and gray iron foundry practice, and with the advancement in the art of special steels, and with the increased use of ingot iron, there has come into the specifications for pig iron other things besides the usual limits for silicon, sulphur, phosphorus and manganese. It is rather strange that the element in pig iron that is usually most abundant, and really is the element that makes it pig iron—carbon—has so long been silent in the specifications. According to present indications, carbon in pig iron will receive more attention.

The increasing use of iron and steel scrap as part of the ore mixture in blast furnaces has introduced into blast furnace practice, just as it did into open-hearth practice, an uncertain factor beyond the control of the blast furnace manager. It is comparatively easy to analyze with sufficient accuracy all the iron ores that make up the burden, but it is next to impossible to get a representative sample of each car of miscellaneous iron and steel scrap that is bought on the scrap market. Under present conditions of practice it would not be possible to analyze all scrap for all the elements that may be injurious to certain grades of pig iron. These elements may be exactly what is needed for special analysis steels, and for iron and steel alloys, but the malleable iron man can't use them and the ingot iron man will not have them.

Malleable iron men more and more are objecting to small percentages of chromium, nickel and titanium in pig iron; the limits of their manganese specifications already were narrow. The makers of ingot iron are fighting against these three elements and also against copper and arsenic.

Until the art of making pig iron has acquired fluxes for removing deleterious elements in the blast furnace, it will be necessary for the furnace manager to forego the use of cheap miscellaneous scrap whenever he is making pig iron to ship on a "fussy" order which prohibits those certain elements. On the other hand the maker of "quality" products must expect that his demands for "quality" raw materials will carry with it the extra cost of "quality."

Blast Furnace Gas

Coincident with the decreased quantity of waste gases on account of less coke per ton of pig, and increased demand for surplus power from the blast furnace power plant, more attention has been given to the economical use of blast furnace gas and to the problems of dry cleaning. Improved burners for hot-blast stoves and boilers have been installed at several blast furnace plants where surplus power can be sold to other departments or to outside customers. Burners with positive control of the mixture of air and gas have given excellent results.

The problem of the dry cleaning of blast furnace gas by electric precipitators is much nearer a commercial solution than ever before. The final design may be simple and economical but there have been many mechanical and electrical difficulties to overcome. Hot dusty gas is hard to handle.

The writer cannot leave the subject of "Progress in Blast Furnace Practice" without expressing his satisfaction over the gratifying progress of the "Campaign for Clean Coal" which was started only two years ago by the blast furnace and coke men of the Southern Ohio Pig Iron and Coke association. The demand of the iron and steel men for lower ash and lower sulphur in their coking coals, gas coals, and steam coals, has greatly helped the coal industry, and has brought about many desirable economies in making iron and steel. The furnace men have demanded "quality" coal, and the coal men have learned that increased price, because of increased quality, is more profitable in the long run than increased price on account of decreased car supply.

Furnace Risk Lower: Farming Higher

BENEFITS of the "safety first" campaign at blast furnace plants are clearly seen in the following extract from a letter recently received from Emile E. Watson, consulting actuary, Columbus, O.

"The basic Ohio state insurance rates for blast furnace workers for the last few years are as follows:

"The downward trend of the rates are an automatic indication of the extent to which the blast furnace experience of the state has been improved. However, these rates fail to reveal the extent of this improvement, inasmuch as the more recent rates have been required to carry losses upon the basis of the legislative increased scale of benefits of the law. For instance, as of Jan. 1, 1924, the maximum weekly benefits were increased from $15 to $18.75 per week or 25 per cent and the maximum death benefits were increased from $5000 to $6500 or 30 per cent.

"The July 1, 1924, rates were the first to catch the full force of this increase, notwithstanding this the $1.90 rate provided a sufficient margin of safety to be able to carry this heavy increase in benefits without the necessity of an increase in the basic manual rate.

"The rate for farming is on the increase as indicated by the fact that the July 1, 1923, rate was $1.20, whereas the July 1, 1924, rate is $1.40, and unless the experience for farming materializes in a remarkable improvement, you are going to see a still further very heavy increase made in the rate for farming, effective July 1, 1925."

Steelmakers Seek Refinements in Rolling

CHANGES in rolling mill design made during the year just closed applied largely to subsidiary equipment rather than to roll stands. A spindle shifting device for blooming mills was designed, which in the case of roll changing, obviates the necessity of unbolting the universal coupling at the roll. Manipulators for blooming mills also were improved. One design brought out during 1924 has incorporated a set of fingers and side guards. These are built above the table and the ingot is tilted by the fingers without the necessity of moving the side guards. Instead of removing the tops of blooming mill tables and lifting off the rollers to get at the line shaft a new table was designed which provides for the sliding of the line shaft back in its bearings and affords easy removal without disturbing the rollers. Producers of bars and small shapes in replacing present equipment or installing new units for producing these commodities are adopting the continuous type in preference to 3-high mills.

The number of automatic tinning machines installed at various tin houses in this country during 1924 shows a substantial increase. The black plates stored on end in a water bosh are moved beneath a set of magnetized rolls and when current is turned on a single plate jumps into the gap of the rolls and is fed automatically into the tinning machine.

More attention also is being given to the doubling of black plate by mechanical means during the hot rolling process. A large number of mechanical doublers was installed last year and over 65 are scheduled for completion this year. By the use of this machine one tin plate producer is obtaining a yield in excess of 10 tons of black plate for a turn per mill. The development of the mechanical matching and doubling machine is one of the few progressive strides made by the tin plate industry since its beginning in this country. Various operations involved in the production of black plate have been rearranged as a result of the development of the mechanical doubler and this revision has increased the output appreciably.

When a sheet or pack of sheets is matched it lies centrally on the flat table of the doubling machine. This table is level with the floor and is hinged in the center. A dividing or holding arm is brought down on top of and across the middle of the sheet or pack just before the two sections of the table begin to fold toward each other. A shear usually is built at right angles to the doubling machine for cutting off the folded portion at one end of the pack.

That the method of preheating sheet and tin mill rolls electrically is looked upon with greater favor is mirrored by the number of heaters of this type installed last year. This type heater is built in two sections each half being clamped to the rolls. The heating element makes direct contact with the surface of the rolls. A detailed description of this type roll heater was presented in the Sept. 6, 1923 issue of IRON TRADE REVIEW.

Electrification of rolling mills in this country during 1924 was carried out on a large scale. Steam engine drives at many sheet mills were replaced by motors while numerous hot beds and hot saws at structural mills were equipped with motor drives. Several blooming mill engines were replaced by motors while practically all new mills of various types completed last year were equipped with electric drives.

A radical departure in rolling mill design is associated with the new blooming mill which together with other type mills, are being built at the River Rouge division of the Ford Motor Co., Detroit. The new blooming mill includes four 2-high stands of 42-inch rolls arranged in tandem for continuous rolling. The main building is divided into numerous bays and in addition to the blooming mill will house a four stand 32-inch billet mill, a chipping department and a four stand 14-inch merchant mill.

Contracts for four 100-ton tilting open-hearth furnaces were let during the close of 1924 by the Ford company and this battery will be the first of a 20-unit steelworks. When the first unit is completed the steel will be refined in electric furnaces, poured into ingots and rolled into bars of forging quality. One 50-ton electric furnace and two 10-ton electric furnaces already are installed. The bars will be forged into various automobile parts in a new forging plant now being built in close proximity to the rolling mills. Ingots 8 x 12 inches will be served to the blooming mill.

The completion of the steelworks will permit converting about 1200 tons of scrap daily into steel thus effecting a saving by eliminating the shipment of waste material to certain steel plants in nearby districts where it now is remelted and returned to the Ford company in the form of steel commodities. The company recently completed a 30,000-kilovolt ampere generator at its River Rouge power station. A unit of similar amperage now is under construction and four additional units are planned. When completed sufficient power in excess of that required to operate the River Rouge plant will be available and this will be used at the Highland Park division and for the partial electrification of the Detroit, Toledo & Ironton railroad. Electric locomotives for this road now are being built.

Foundrymen Improve Casting Practice

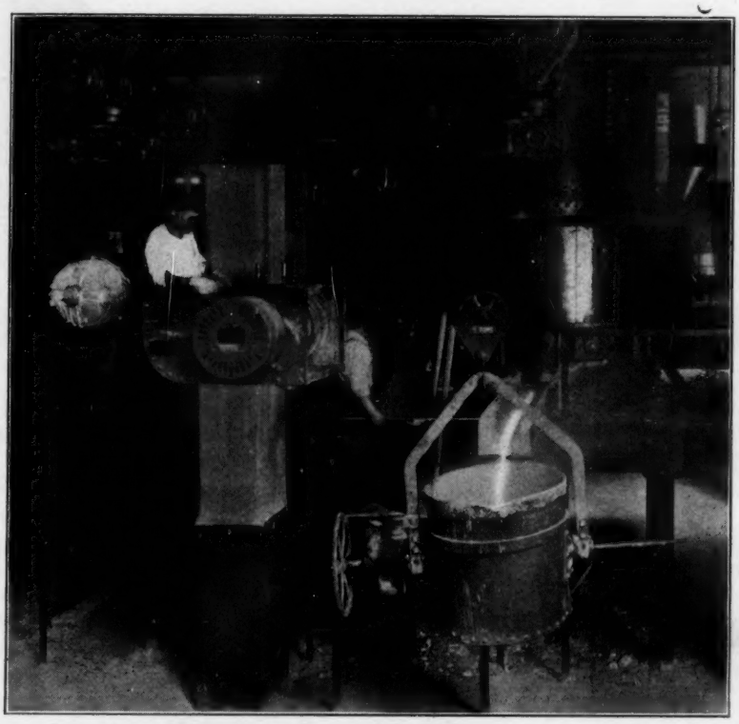
By Dan M. Avey

WERE it possible to plot accurately the progress made in industry from year to year, or to measure by some common standard of value the gain in methods as represented by the work of inventive minds during such a fixed period, doubtless the greatest accomplishment and the most worthwhile inventions would be found in periods of greatest depression or the most bustling prosperity. These extremes alike are conducive to effort and furnish fertile fields for new ideas.

The year just past represents neither of these extremes in the foundry business cycle. Practically all branches of the industry have encountered an average demand for their products unaccompanied by the driving stress of peak production or by continued idleness. For this reason the accomplishment of the period is measured by improvement in existing practice, by the application of known principles and by a closer attention to perfection of detail. Faced by labor shortage during a previous period of foundry activity, many individual plants have studied their apprentice or other training problems in a more intensive fashion. A district plan combining shop experience with public school instruction and having for its object a directional influence on the boys and younger workmen has proved singularly successful. The basic idea has been state control of the apprentice contract relation, the co-operation of manufacturers with school authorities and with other business interests. This was accomplished in Wisconsin. Notable progress also has been made in Pennsylvania along apprentice training lines and an ambitious nation-wide program has been announced by the National Founders association.

Organized research has been directed along few lines bearing upon castings manufacture. The joint committee on sand research, organized by the American Foundrymen's association with the National Research council and the American Society for Testing Materials has adopted tentative methods of testing sand. These include a bonding or cohesiveness test, standards for measuring permeability and fineness, and suggestions for taking samples and making chemical analyses.

Attention has been directed more strongly to casting metals in permanent or die molds. A differential is made between those castings made by metal entering and filling a mold cavity by gravity and those which are produced by the application of pressure. The former are termed permanent mold castings and the latter die castings. The success which has attended the manufacture of aluminum pistons, sweeper parts and other small castings in white metal has brought about a wider use of die molds for nonferrous metals, where a multiplicity of small castings is sought. Small iron castings such as gears for washing machines and similar parts have been produced in die molds, more than a hundred thousand having been made from a single mold. Investigations are in progress which probably will



HANDLING METAL, AS WELL AS RAW MATERIALS, FLASKS AND FINISHED CASTINGS IS RECOGNIZED AS ONE OF THE BIGGEST JOBS IN A FOUNDRY

The author is managing editor of *The Foundry*, Cleveland.

develop permanent molds for the manufacture of standard production jobs, such as automobile gray iron castings of the less intricate form. These castings have been made satisfactorily on an experimental basis without the injurious effect of white chill on the outer structure of the metal and with satisfactory mold life. The permanent mold question also is attracting attention from makers of small malleable castings.

The centrifugal casting process, as applied to iron pipe has been extended. Further, experiments have been conducted on the manufacture of pressure pipe from gray iron poured into hollow sand molds, which are rotated, producing the necessary opening in the pipe without the assistance of cores. Expermental study has been directed toward making hollow castings by the application of centrifugal force in two directions. That is two axes of rotation give the application of force in two planes. The mold, containing a predetermined amount of metal is closed tightly and spun in a manner which throws the metal to the inner mold surface, leaving the center portion of the casting hollow.

In metallurgical lines, increased emphasis has been placed upon corrosion resistance properties. The technical society meetings during the year have concentrated largely upon this problem. The American Society for Testing Materials in co-operation with users' organizations such as the American Waterworks association is studying the strength and service requirements of cast iron under the destructive effects of actual conditions with revised specification in mind. Progress has been made in different alloy additions to increase resistance to corrosion, acids and wear on parts made of gray iron. Special heat treatment as applied by different individual companies is said to have increased the range of tensile strength of this class of castings. Nickel and chromium irons have been investigated by automobile cylinder foundries.

Some study has been devoted to shortening the time of anneal for malleable castings, but no definite reports of progress have been made.

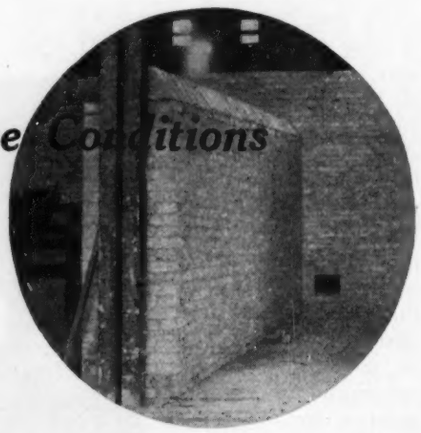
Handling costs have assumed major importance in castings manufacture during the past few years. More recent construction has been remarkable for the development in mechanical transport of metal, fuel and castings and sand handling and conditioning systems. Hand labor for unloading, transfer from storage, mixing, blending and final delivery of sand to the molding floor constitutes an exception in the large plants completed or projected during 1924.

In line with the economies sought in handling some of the notable shops put in service during the past year have endeavored to make their facilities more compact. The delivery of sand to overhead bins, mixing on a mezzanine floor, transfer by chutes to the molding machines and final removal of castings and waste material through tunnels serve to rid the foundry floor of the confusion incident to handling bulky commodities used in the foundry.

Experimental work still is going forward on the regenerative type of cupola in which the blast emerging through the charge is passed out through a checkerwork, preheating a chamber later used for the entering air. This tendency in cupola practice, the wider interest in electric furnaces for nonferrous metals and gray iron as well as for steel has laid upon the doorstep of the refractory manufacturer an entirely new set of problems.

The use of petroleum coke or a combination of oil for preheating with coke for melting the charge in a cupola are developments in the southwestern section where oil is cheap and coke expensive due to freight rates. Powdered coal practice especially as typified in melting malleable iron in the air furnace has shown remarkable progress during the year just closed.

Refractories Users Study Furnace Conditions



By L. S. Longenecker

USERS of refractories in 1924 paid more attention to furnace conditions and co-operated more closely with manufacturers of refractory materials than ever before. With more unity of purpose among producers and consumers, research work has gone forward rapidly.

In addition to carrying on a large volume of testing work, the refractories fellowship at Mellon institute has produced marked results on a new type spalling test furnace. Further investigations covering all the factors instrumental in producing spalling are being made. The present heating and quenching spalling test has been subjected to criticism and the new test method appears to be a more scientific one and may eliminate some of the objections now aimed at the quenching method.

The Mellon institute fellowship also is studying the variation in size of fire-clay brick and shapes. An effort is being made to determine the causes of variation in size and to discover efficient and economical remedies.

An agreement between the department of the interior and the refractory consumers has been made whereby a survey and study of present plant conditions, relating to the use of refractories, will be conducted by the engineers of the bureau of mines, throughout a score or more industrial plants,

At the meeting of the American Ceramic society held at Atlantic City last spring, open hearth refractories were discussed at length. Consumers of refractories referred to their furnaces in terms of zones or sections as determined by the cost of maintaining these sections throughout a furnace run. The two main sections causing the most concern were the front wall and the roof. The

front wall was referred to as being the most costly section since several front walls are required to complete a furnace run. It was made apparent that considerable additional money could be expended on the original material front wall cost if a satisfactory material could be secured that would run the complete life of a roof. Fig. 1 shows a cross section of a silica-magnesite front wall after a run of approximately 70 heats, or about one-third the total life of a roof. The sketch was drawn to scale from actual furnace measurements and clearly shows the intense slag-eating and growing-out behavior of a front wall at the junction point of the silica and magnesite. This also is generally the intense slag line or zone. Common furnace practice is to fill up this groove with dolomite, which however, does not prove satisfactory since the silica brick and dolomite are of opposite chemical nature.

Improving Open-Hearth Roof

The discussion of open-hearth roofs centered about the trouble experienced by the dropping out of loose broken tile ends. The impression was given that a silica roof does not fuse away so much as it drops away. The loss of one well glazed tile end exposes that immediate section of unseasoned brick open to all the severe furnace conditions. The fact that these points, in most cases, will not reglaze again was indicated as the cause of most of the required roof hot patching and premature failures. It was noted that if the warpage in these arch tiles could be eliminated it probably would go a long way in helping to solve this trouble. Just how practical and economical this solution would be, is a question worth consideration.

It was considered doubtful whether it be possible for a consumer to install good, straight material in a perfect arch. The skewbacks and channel irons in most cases vary enough to make it almost impossible to lay up a perfect arch.

Extremely satisfactory experimental work has been done on a special patented interlocking tile, as shown in Fig. 2. The interlocking arrangement in this case prevents broken parts of a tile from falling away, regardless of warpage and the variance that may occur in installing the material. Fig. 2 shows in perspective the interlocking arrangement between the whole tile *B* and the part tile *A*. It can be seen how the loose hanging broken tile end *A* is supported by tile *B*. Due to the incomplete records as yet, this idea has not been given any great publicity. To the interested however, the idea is open for consideration.

Another interesting item in open-hearth refractory practice is the cost classification used by the consumer in determining an economical refractory product. The

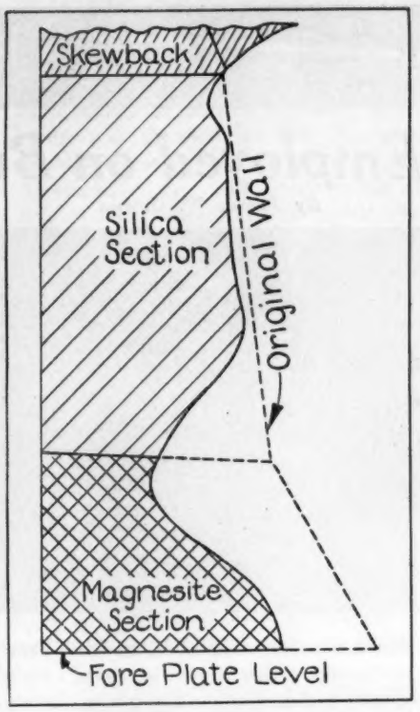


FIG. 1—SECTION OF SILICA-MAGNESITE OPEN-HEARTH FRONT WALL AFTER 70 HEATS

cost installed of a given refractory is described as embracing the following three items: material, labor to install, and lost furnace time. The two first named items are self-explanatory and are usually considered, but the third item sometimes is omitted. Lost furnace time should be considered when determining the most economical refractory material.

During the last year consumers of refrac-

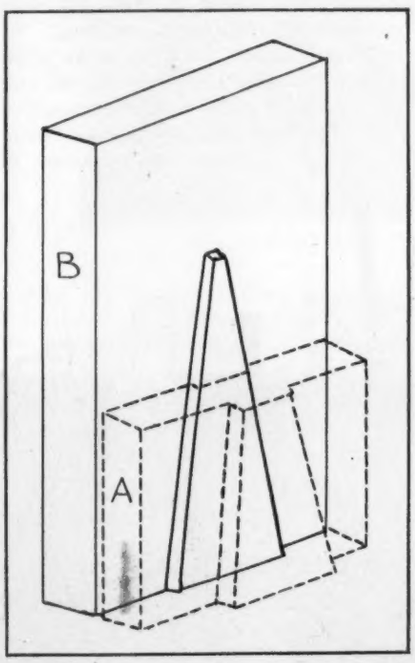


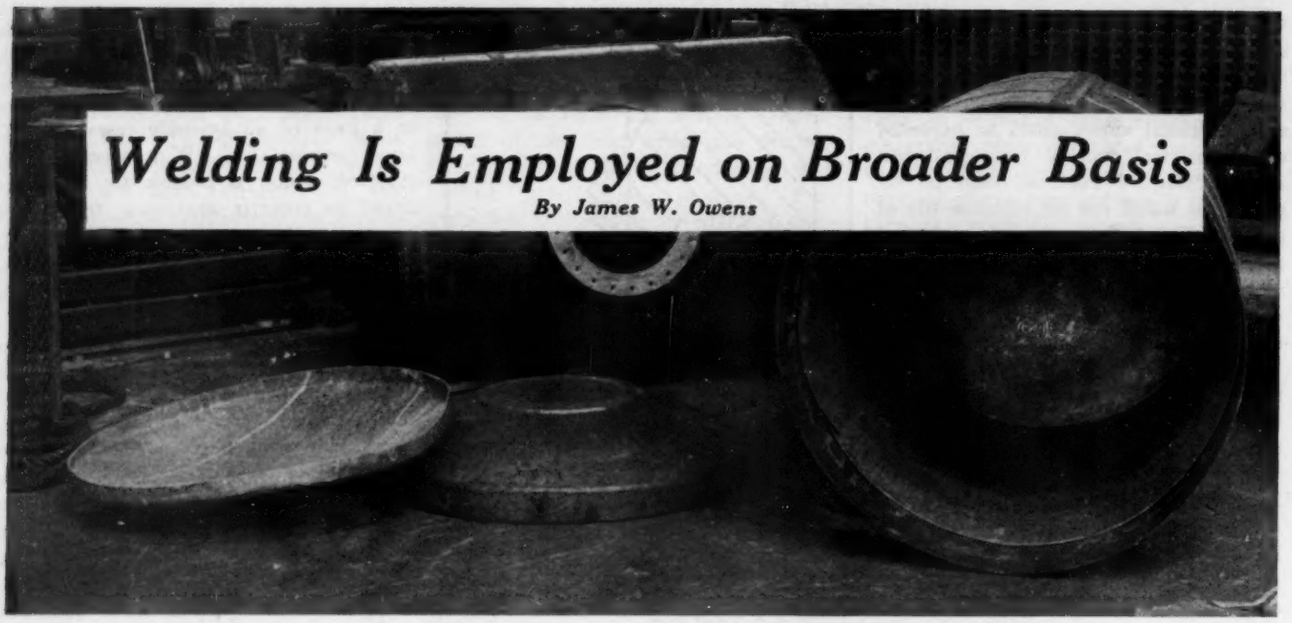
FIG. 2—DESIGN OF INTERLOCKING ROOF TILE TO PREVENT FALL OF BROKEN PARTS

tories have made progress in buying silica and magnesite bricks according to specifications. Silica and magnesite brick specifications now in use were worked upon a basis of all available research and actual service data. With specifications standard, it now is possible for the consumer to properly analyze a refractory material, and to study it systematically in conjunction with its service behavior. The consumer then can definitely specify in known terms to the manufacturer what item or items are of most concern in a purchased material.

Marked progress has been made in increasing the service of boiler refractories. By using a common cement gun a mixture of ground clay brick bats and a high temperature cement can now be applied successfully to the surface of a firebox. The mix used is made up on a ratio of about three parts of brick bats to one part of cement. The material is shot onto the brick to an average thickness of about one-fourth inch. This not only coats the surface but fills in all cracks and holes which may be serious enough, at times, to cause premature refractory failures.

An interesting development has been made in the economic use of plastic hot patching materials in heating furnaces. Many heating furnaces undergo much severe mechanical wear and tear in and about the charging doors. A satisfactory patching material that can be applied to the hot surface of a vertical wall or on the lower face of an arch, makes it possible to maintain these sections in a good regular condition up to the complete service life of a roof. This hot patching practice when properly used has produced an appreciable saving in heating furnace refractory cost, and lost furnace time. In severe cases the maintenance cost of the steel structure and "buckstays" about the furnace has been reduced as much as 50 per cent by keeping the door jambs and arches well patched and sealed against flame leaks.

Many forward steps have been made in the past year in determining the best use of a refractory under actual furnace conditions. Consumers now are receiving refractory materials of promising merit and putting them through what might be termed a comparative endurance test. The comparative endurance tests are made simply by placing an unknown material in a similar furnace location with a known material and carefully observing the comparative service behavior. By this method it is very easy to determine how the unknown material compares with the generally used material, under actual furnace conditions. The data and results secured from a number of such satisfactory tests show readily whether or not the tested material is an economical product for a definite use.



Welding Is Employed on Broader Basis

By James W. Owens

NO LONGER do riveted joints and mechanical seams hold undisputed sway in the structural field. The numerous advantages of welding constantly are being more widely recognized by engineers and executives with the result that this method of uniting metals is rapidly growing in favor.

Some of these advantages are a lowered cost of construction; a reduction in weight and the accompanying saving in the cost of freight and handling; the use of joints which are oil, water and gas tight up to their ultimate strength; the possibility of securing ultimate strengths in structural material which are greater than that of the base metal; the utilization of structural shapes which are not suitable for riveting; the elimination of noise, etc.

This recognition is evidenced by the large volume of business being done by manufacturers of welding equipment, accessories and supplies, and the greater number of articles appearing in the technical press dealing with all phases of the subject. Several improvements have been made during the past year in equipment and methods of application, all of which tend toward a reduction in the cost of welding and cutting and a widening in their scope of application. In machine smith welding, large size hammer-welded pipe now is being made by the National Tube Co. at its Christy Park works. Pipes of 30 inches in diameter, and having a 1-inch wall are made possible by this method. In the resistance welding field, the Thompson Electric Welding Co. has developed an automatic butt welding machine for welding stock 0.1 to 0.5 inches in diameter, and by means of a new method is able to take care of the enormous currents and pressures required by large welding machines, and which heretofore were considered prohibitive. The Alexander Milburn Co. reports an improvement in its gas cutting torch tips which effects a saving in gases, secures greater cutting speed and a smoother cut. This improvement consists in inclining the preheating holes in the tip at an angle of approximately 15 degrees to the cutting orifice. The Smith Perforating Co., Pittsburgh, Pa., has developed a "nonconsuming" electrode, the operation of which is similar to that of the carbon arc. However, a water cooled copper electrode is used instead of a carbon electrode, and the arc is magnetically controlled. Among the advantages secured by this method are a better control of the arc than is possible in carbon arc welding, and the elimination of carbon transference to the weld.

In considering the various fields of application, we find a considerable increase of resistance welding in the quantity production of all steel automobile bodies, automobile parts in general, disc wheels, steel culverts, metal furniture, steel joists for fireproof building, metal lath, reinforcement for cement and concrete work, mowing machine cutter bars, etc., as well as in welding practically all nonferrous materials.

Some years ago the use of welding in heavy structural work was demonstrated successfully in spot welding freight cars and recently extensive tests were conducted at the United States bureau of standards for the American Bridge Co. on the application of spot welding to the construction of girders and columns. Another application has been the use of resistance seam welding in salvaging scrap metal for the manufacture of inexpensive woven fruit baskets The use of the German seam welders, using an interrupted current and manufactured by the Gibb Welding Machine Co. has increased on classes

METAL ARC WELDED TANKER 80 FEET LONG, THE LARGEST SEAGOING, COMPLETELY WELDED STRUCTURE IN THE UNITED STATES

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of work on which this machine is suitable.

Possibly the largest application of gas welding during 1924 has been in the construction of an 18-inch pipe line from Northern Louisiana across East Texas, by the Mangolia Gas Co. This line has about 63,000 welds and crosses two large rivers, many ravines, bayous and swamps. It was first tested at 130 pounds air pressure, and then with 550 to 900 pounds hydraulic pressure.

About one dozen cast iron pipe lines were laid last year by the Linde Air Products Co., using a straight butt joint, on the outside of which was deposited a ridge of bronze extending around the pipe like a collar. Tests have shown that this form of joint can be made stronger than the pipe itself. It is finding favor for city distribution systems, because it reduces upkeep costs to a minimum, and permits the use of higher pressures.

The use of this joint also is being considered for structural steel members, for the thermal effect in the vicinity of the weld is negligible. The weld is made faster, and the consumption of the gases is much less than when an iron or steel welding rod is used.

The advantages of metal arc welding, as a means of fabricating large structures, was stressed by the American Welding society at its fall convention in Cleveland. At this convention it launched an extensive structural research program.

Last November a metal arc welded tanker, 80 feet long, 26 foot beam and 12 foot draft was launched at Providence, R. I. Designed and built by F. T. Saxe, it is the largest seagoing, watertight, completely welded structure yet constructed in the United States, and is another progressive step in American shipbuilding. Two factory buildings 25 x 50 feet, and 11 feet high have been constructed by the General Boilers Co. at a total cost of $7.55 per cubic foot, or $6.55 per 100 pounds.

A large order of mine trucks for the ordnance department was re-designed for welding and considerable savings thereby effected. Altogether it is estimated that at the Norfolk yard alone, a total of 250 tons of structural work was fabricated by metal arc welding during the past year. This yard recently co-operated with the Westinghouse Electric & Mfg. Co. in a series of tests on carbon arc cutting, and although it is probable that this method of cutting will never supplant the gas torch for smooth and efficient cutting of steel plates over one-half inch thick, nevertheless it has made much progress as a wrecking tool for the cutting of steel plates below one-half inch, cast iron and the nonferrous metals because of its low cost.

Developments in thermit welding have consisted in improvement in the mode of application, whereby savings of about 50 per cent have been effected in the amount of thermit used in making certain welds by the methods formerly used with this material.

Larger Units of Electrical Equipment Appear

BY H. W. COPE

THE world is moving forward with tremendous speed and it becomes almost impossible to keep abreast of the times. It is fitting, therefore, to pause for a moment as the year draws to a close and "take stock," of what has been done and achieved during the year just passed.

Turbines, turbo-generators, synchronous condensers, motor-generator sets, rotary converters and transformers are being built in larger and larger sizes. New and improved types of drive and control have been devised for the more successful and accurate use of this electrical machinery. Switching equipment of the truck type and automatic-supervisory control are becoming more and more popular. Improvements in these have been made and today they operate the machinery with better results than when under manual control.

The design of motor-generator sets has progressed so remarkably that during the year a set has been built and successfully tested, having a capacity of 1500 horsepower, yet of small enough size and weight to permit its being successfully mounted in the cab of an electric locomotive.

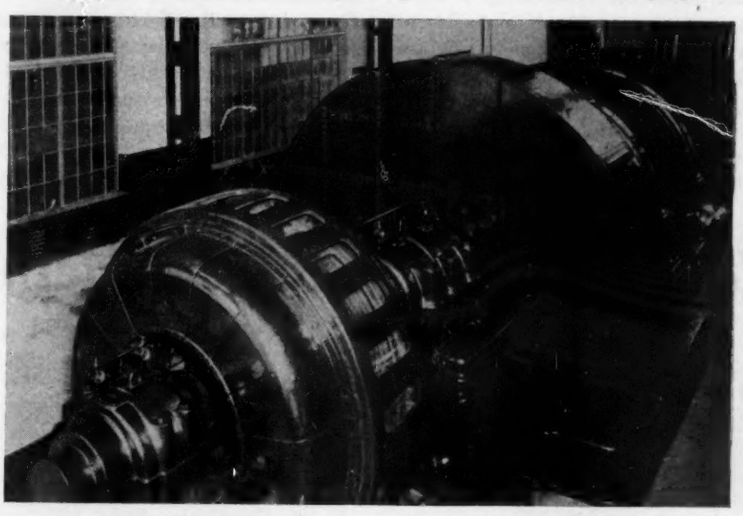
Several large-sized, single-flow turbines using a multiple exhaust arrangement of the low-pressure blading have been developed.

For industrial size turbines, a hydraulic type of governor has been placed in successful operation. This new form of governor has proved much more durable, more sensitive and more powerful than governors formerly used on this type of machine.

The past year has been notable for the large number of electrical equipments for main line motive power units on steam railroads that have been put in service, or that the Westinghouse company has in process of manufacture.

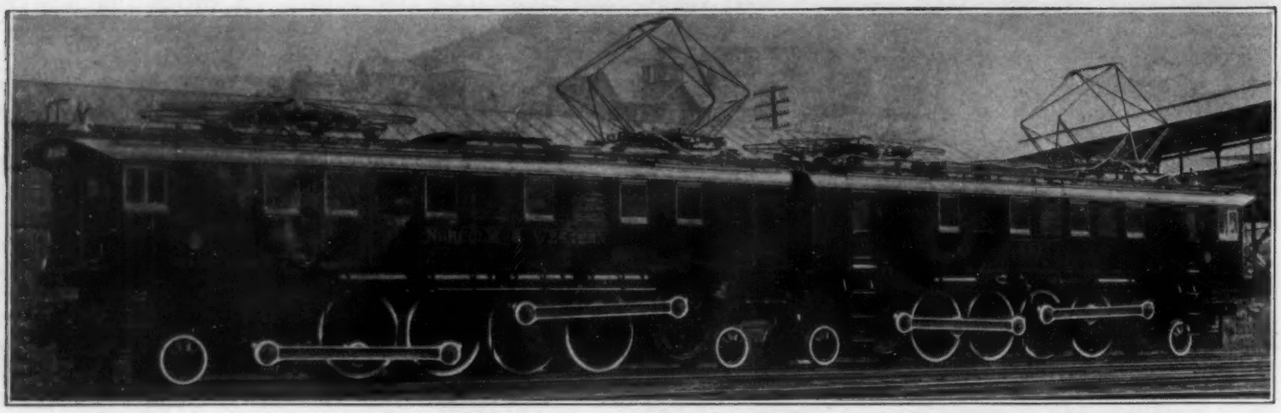
The construction of light weight oil engines has progressed to a point where it is now feasible to apply them as the prime mover in locomotives. The Westinghouse Electric & Mfg. Co. and the Baldwin Locomotive Works are constructing a 1000-horsepower locomotive of this type, which will weigh approximately 125 tons, will be of the box cab type, and will have an 0-6-0 0-6-0 wheel arrangement. The engine will be of the Knudson design, which is a double-opposed piston engine, two-cycle, using scavenging and supercharging air at approximately three pounds pressure.

The most remarkable feature of the electrification of steel mills has been the large number of orders received during this year of comparative dull times for



Motor generator set for 7000-horsepower blooming mill motor

Abstracted from "The Engineering Achievements of the Westinghouse Electric & Mfg. Co." The author is assistant director of engineering of that company, at East Pittsburgh, Pa.



ONE COMPANY BUILT OR WAS BUILDING 235 MAIN LINE ELECTRIC LOCOMOTIVES IN 1924

the steel industry. This fact is a most striking indication of the economy and reliability of electric operation.

Five reversing equipments have been sold, including two large reversing blooming mills, two roughing structural mills and one finishing structural mill.

One of the greatest advances in the art was made this year when the company placed in operation a 5000-horsepower single unit reversing mill, which received its power from two 2100 kilowatt generators operating in parallel. It has heretofore been considered necessary to drive one motor from a single generator, and if two motors were used, two generators were required. By this new arrangement, it is possible to design both motors and generators to best meet their operating condition, rather than to have the design determined by the number of units of which the equipment is composed.

A foot-operated master switch has been developed which to date has only been used for controlling reversing motors, but the application of which will undoubtedly be made in many other places. This master switch reduces the number of men required in the pulpit of a blooming mill from three to two.

A great advance has been made in the control of blooming mill auxiliaries, by the installation of two entirely separate control circuits, either of which can be used at will. Each master switch is plugged into a receptable, and in case of trouble can quickly be replaced by a spare. A complete spare control panel is included which can be quickly transferred to any motor.

The use of automatic substations in steel mills has increased to a considerable extent. One large steel plant has changed over all its manual stations, involving five motor-generator sets and a large number of alternating current and direct current feeders, to full automatic control. At another plant, a full automatic substation has been installed to control two 1000-kilowatt motor-generator sets and all direct current and alternating current feeders. A third plant has installed three equipments for the operation of motor-generator sets and feeders.

This increase in the number of installations has been due primarily to the extreme reliability of operation together with the operating saving that can be shown as compared with manual control to take place at the point where the power is used, thereby reducing the line losses in the feeder circuits.

Heat Treating Analysis Methods Are Advanced

BY RAY T. BAYLESS

PROGRESS in heat treating during 1924 for the most part is to be found in the study of methods for inspecting and analyzing treated work and not in the direct development of heat treating process. Nevertheless, more reliable and intelligent means for the study of metals invariably reflects itself in modification of the processes or treatments through which the metal passes. Much of the work done during the year consisted of research into X-ray examination, high power magnification, conical illumination and magnetic testing—all problems of importance to the metallurgist. The use of salt baths as both heating and quenching media has received greater favor and steps have been taken to clear up some of the problems which concern the hardness of metals. Short time malleable annealing also has been advanced but the commercial value of the method has not been determined. Many new heat treating furnace installations have been made and are playing an important part in the production of treated work with greater efficiency and economy.

Much research work has been done in the testing of metals for toughness, hardness, resistance to high temperatures and resistance to corrosion. The work of Langenberg, Richardson and MacNutt, Moser and many others has added much to our knowledge of impact testing of metals and their tests have covered a wide range of temperature. This work has its direct application to many branches of industry, chief among which is the automotive. The study of hardness, what it is and methods for properly determining it, have continued, and during 1924, has received attention from several committees of technical societies. One of the interesting features associated with the study of hardness is its determination magnetically. The work of S. R. Williams is of especial interest and should result in the practical application of a rapid nondestructive method for determining the hardness of objects such as ball bearings. The work of A. V. deForest, in which he has correlated elasticity and fatigue properties of steel with magnetic properties, also promises to be of considerable use.

Corrosion resistance and high temperature resistance of metals has been given more consideration during the year, several governmental bureaus devoting attention to the subject. Symposiums of technical societies at Cleveland and Atlantic City on the heat and corrosion resistance of metals have added information of importance. Commercial application is being made of this information, especially in the work being done with high pressure steam installations wherein much higher temperatures and pressures are being used than were possible a year or two ago. The improvement of metallurgical equipment through the use of heat resisting alloys is one of the chief commercial applica-

The author is editor of *Transactions* of the American Society for Steel Treating, Cleveland.

tions of these studies. Stainless steels and irons have been given a conspicuous place in the deliberations of several of our scientific societies and in the past year, many developments and commercial applications have been made as a result. The need for noncorroding materials is a decided necessity.

Study of salt baths as heating and quenching media was continued, with the work of Tour, Merten and Bellis being of note. Tour and Bellis confined their studies to salt baths as heating media, while Merten has combined his with a study of suitable quenching media for quenching salt-heated tool steels, for the purpose of avoiding soft spots. Merten's work bids well to have a wide commercial application.

Considerable work was accomplished in the study of quenching media for all types of quenching although the outstanding research on this subject was done by French and Klopsch of the bureau of standards. Only progress reports have been available but indications are that the completed work will provide many practical applications for hardening rooms.

A particularly valuable contribution to the art of heat treatment was the work of MacPherran and Harper in which they proposed suitable heat treatment whereby the cementite of the pearlitic constituent in steel forgings or castings is spheroidized, and the tensile properties tend to become the same in all directions. The transverse and radial ductility is greatly increased by spheroidizing.

One of the outstanding researches which was reported more than a year ago but which has matured this year into practical application, is the so-called "conical illumination" method of photomicrography described by H. S. George. The mechanism necessary to properly produce this condition of perspective in making photomicrographs has been adopted and incorporated on several of the photomicrographic outfits which are on the market today The use of this method of photomicrography no doubt will be of considerable use in the study of metallic structures and may even reveal conditions that were unseen under previous arrangements of the optical systems.

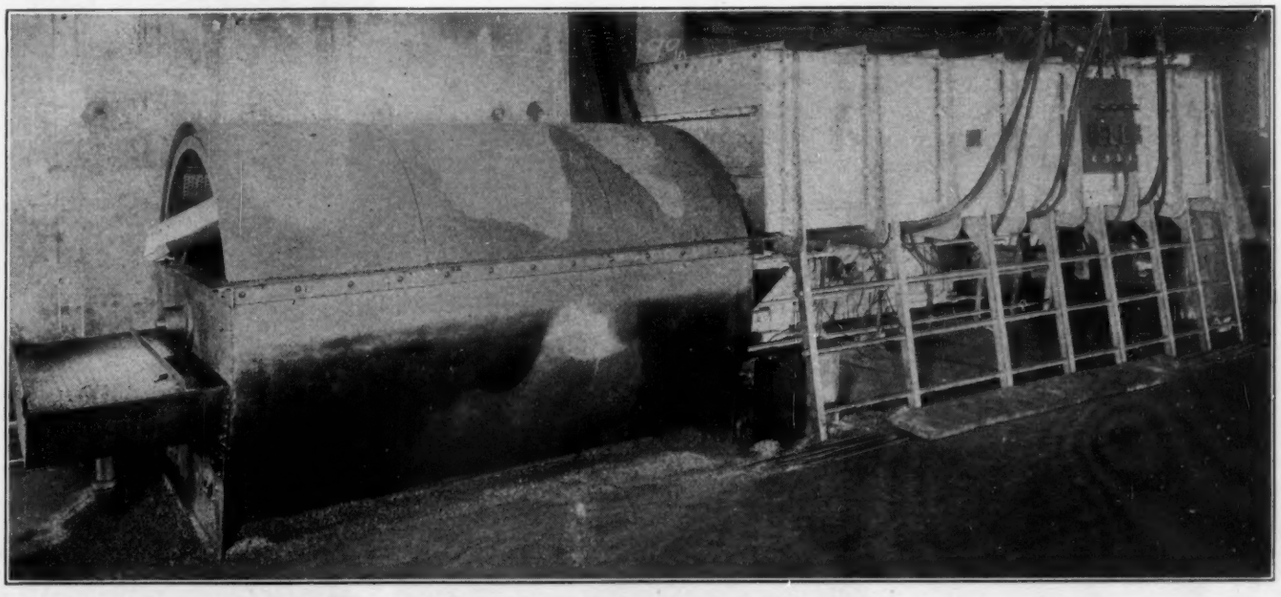
The high power photomicrographic studies of metals were continued by F. F. Lucas during the year. The author's more recent work in the high power study of iron-carbon alloys has demonstrated his skillful technique in the preparation of metallic specimens for photomicrographic work and from which logical deductions of scientific value may be drawn. High-power metallography presents a new tool to the scientific worker in the metallurgical field of research and the revelations by high-power photomicrography seem to corroborate the findings by X-ray analyses.

A worthy contribution to the science of engineering is the work of Heymans, Brophy and Kimball in their photoelastic methods for the determination of the causes of failures in certain metal structures. In this investigation transparent celluloid replicas of gear pinions were prepared and suitably mounted so that actual working conditions were simulated. Plain polarized light was passed through these gears and careful studies were made of the strain-zones. From these tests accurate deductions were made as to the causes of failures of gears in service.

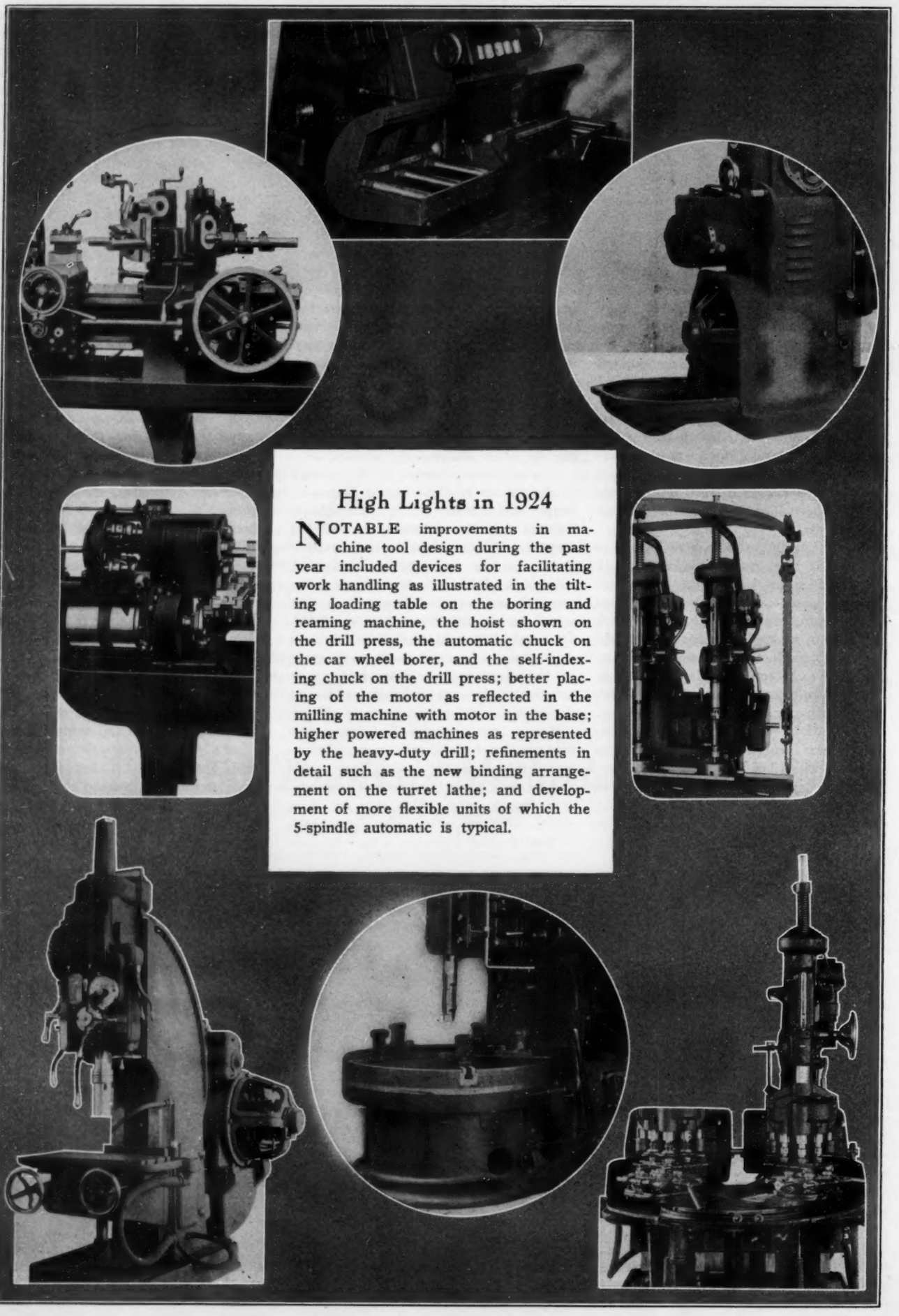
It has been observed that many new heat treating furnace equipments were installed throughout the country during 1924 and many of these have been of the automatic-hearth type. One of the most recent additions which have been made to heat treating furnaces is the recuperator, using both refractory and metallic installations. Generally speaking, these various equipments represent a distinct advancement in the art; not only do they provide for greater efficiency in operation and fuel saving, but they use preheated air for combustion which produces a flame of such characteristics that more uniform temperature conditions are effected in the furnace, the production of the furnace per unit time is greater, and the cost of production is much reduced.

Development of the use of X-rays in the inspection of steel castings has been one of the features of the year. The work of Dr. H. H. Lester is the most important work that has been done on this subject. While this application is one pertaining largely to foundry practice, nevertheless, it is important to all metallurgists. The cost of conducting exhaustive X-ray examinations of steel castings for the purpose of detecting imperfections is an appreciable one, therefore, the feasibility of making 100 per cent inspections on production is questionable.

Perhaps one of the most unique and valuable contributions to the art of metallurgy and heat treatment this past year is the work of Major R. H. Smith, who has developed methods for obtaining unusually high tensile strengths in low carbon steels, still retaining high ductility. This method is one in which the rate of cooling is increased decidedly by applying the quenching water under pressure. Major Smith has produced in steels having a carbon content of 0.9 per cent physical properties, which previously were believed impossible with such a steel. This method is being used commercially in the production of bolts and rivets and has possibilities for a wide spread use.



ELECTRIC HEAT TREATING EQUIPMENT FOR HANDLING BALL BEARING RACES



High Lights in 1924

NOTABLE improvements in machine tool design during the past year included devices for facilitating work handling as illustrated in the tilting loading table on the boring and reaming machine, the hoist shown on the drill press, the automatic chuck on the car wheel borer, and the self-indexing chuck on the drill press; better placing of the motor as reflected in the milling machine with motor in the base; higher powered machines as represented by the heavy-duty drill; refinements in detail such as the new binding arrangement on the turret lathe; and development of more flexible units of which the 5-spindle automatic is typical.

Machine Tools Refined in 1924

Manufacturers Devote Most Attention to Improvement of Existing Models Rather Than Development of New—Production Is Speeded Up by Material Handling Devices Built on Machines

BY E. F. ROSS

PROGRESS in machine tool design in 1924 was conspicuous more from the point of refinement to existing models of machines rather than from the introduction of entirely new models. In the main, this refinement has concerned details of construction and not general design. Relatively few machines, new in principle, were announced during the past year. Among the refinements should be mentioned the increasing use of individual motor drive and a more determined effort of designers to mount the motor most advantageously. The trend also has been to use greater power on heavy equipment. A number of machines have included the application of ball bearings in the new models. Another notable achievement of the year was the incorporation of material handling devices such as cranes on special purpose tools. Production also has been speeded up by a greater use of multiple loading tables. Two other items which should be mentioned are the application of welding to frame construction and a localizing of controls to gain a greater ease in operation.

Certain industries purchase only individual motor drive machines and this has been a factor in the development of tools so equipped. This type is becoming so generally standard that in announcing new machines to users, manufacturers often state that lineshaft drive can be provided if desired. Hand in hand with the increased use of individual motor drive has developed the problem of finding the best positions for mounting the motors. Space limitation and vibration are important factors in the question. In the case of lathes, motors usually are mounted on the headstocks or rear legs; in drilling machines, at the top of the spindle, on the column or base; and in boring mills, planers and other heavy tools, base mounting seems most popular. With the exception of some types of grinding machines, the motor seldom is mounted within the base of the tool. When design permits, this location offers advantages such as compactness, direct gearing, quietness of operation, and protection to the motor from dust accumulation. A milling machine announced during the last few days features the motor mounted in this fashion, a hinged cover on the base being removable to allow oiling and inspection of the motor.

A more extensive use of ball bearings also has been noticed during the past year and a number of tool builders have redesigned older models of

Annual Digest of Machine Tools

SINCE last February IRON TRADE REVIEW *has devoted from six to eight pages in the first issue of each month to an analytical and descriptive digest of new machine tools. The principal features of each month's developments in design and construction and important problems of the machine tool industry have been discussed briefly. In addition, the machines, small tools and items of shop equipment brought out during the preceding 30 days have been illustrated and described in a way intended to afford busy executives the necessary information regarding the tool without burdening them with superfluous detail.*

The following is a recapitulation of the machine tools and other equipment for use in machine shops described in the ten monthly digests in 1924. It does not include more than a hundred items which have applications in other than machine shops. The entire list appeared in the Dec. 4 issue, and an index covering 11 months, including December, will be published in the Jan. 8 issue.

BORING AND REAMING MACHINES

No.	Machine	Manufacturer	Issue	Page
9.	Car wheel boring mill	Betts Machine Works	2/7,	426
23.	Boring and turning mill	Betts Machine Works	3/6,	678
34.	Boring and reaming mill	Ingersoll Milling Machine Co.	3/6,	681
102.	Car wheel boring mill	Betts Machine Works	6/5,	1508
166.	Rod boring mill	Consolidated Machine Tool Corp.	9/4,	607

BROACHING MACHINES

No.	Machine	Manufacturer	Issue	Page
71.	Broaching fixture	Hercules Mfg. Co.	5/1,	1172

DRILLING MACHINES

No.	Machine	Manufacturer	Issue	Page
45.	Drilling and tapping machine	Barnes Drill Co.	4/3,	924
53.	Three-way horizontal drill	Stamets, William K.	4/3,	926
63.	Gang drill	Barnes Drill Co.	4/3,	929
78.	Automatic drilling machine	Barnes Drill Co.	5/1,	1174
90.	Pneumatic tapping machine	Gaterman Mfg. Co., W.	5/1,	1178
144.	Heavy duty drilling machine	Foote-Burt Co.	8/7,	361
161.	Vertical drill press	Henry & Wright Mfg. Co.	8/7,	365
168.	Drilling and boring machine	Baker Bros., Inc.	9/4,	608
197.	Drilling and tapping machine	Barnes Drill Co.	11/6,	1236
198.	Multiple spindle drill	Defiance Machine Works	11/6,	1236
223.	Drilling machine	Foote-Burt Co.	12/4,	1504

DRILLS, Bench and Portable

No.	Machine	Manufacturer	Issue	Page
60.	Air motor drill	Chicago Pneumatic Tool Co.	4/3,	928
66.	Air motor drill	Ingersoll-Rand Co.	4/3,	929
173.	Drill stand	Hisey-Wolf Machine Co.	9/4,	609

GRINDING MACHINES

No.	Machine	Manufacturer	Issue	Page
1.	Involute gear grinder	Fellows Gear Shaper Co.	2/7,	424
14.	Drill grinding machine	Oliver Instrument Co.	2/7,	427
25.	Surface grinding machine	Blanchard Machine Co.	3/6,	678
30.	Face grinding machine	Diamond Machine Co.	3/6,	680
35.	Abrasive band grinder	Walls Sales Corp.	3/6,	682
36.	Electric tool grinder	Forbes & Myers	3/6,	682
47.	Automatic surface grinder	Wilmarth & Morman Co.	4/3,	924
54.	Cutter and tool grinder	Wilmarth & Morman Co.	4/3,	926
62.	Grinding and polishing machine	Production Machine Co.	4/3,	928
73.	Universal grinding machine	Brown & Sharpe Mfg. Co.	5/1,	1172
77.	Hob grinding machine	Harris Engineering Co.	5/1,	1174
81.	Production grinding machine	Landis Tool Co.	5/1,	1174
89.	Tool grinder	Mummert-Dixon Co.	5/1,	1177
111.	Internal grinding machine	Giddings & Lewis Machine Tool Co.	6/5,	1519
117.	Disk grinder	Carpenter Engineering & Machine Co.	6/5,	1512
126.	Tool-room grinder	Gallmeyer & Livingston Co.	7/3,	42

(Continued on Next Page)

machines to incorporate ball bearings. Many of the new machines also include this type of bearing.

Structural details of machines also have undergone slight changes in the interest of economy and efficiency. It is highly essential that machines producing accurate work be free from vibration, consequently an effort has been made to provide a more even balance between the various parts. Metal has been taken away from some members and added to others. A number of tools have undergone changes in design to their bases in the interest of rigidity. Facing severe competition in the machine tool industry, manufacturers have overlooked no means for securing greater economy. A number of new methods of fabrication have been adopted and principal among them may be cited the use of welding in frame construction. In some cases this has reduced weight without sacrificing strength.

Designers are ever bearing in mind that in addition to performing their intended work accurately, machines should produce at the highest possible rate. In many cases it has been found that machine tools can produce work at a rate faster than the work can be brought to and taken away from the machine. The solution of this problem, however, has been left to the purchaser of the tools. During 1924 some manufacturers have devoted attention to this matter in an effort to handle work to and from the machine at a rate somewhere near the production capacity of the machine. One notable example is that of a car wheel borer which is provided with two pneumatic type hoists, one on each side, but independent of each other. These hoists are built integral with the machine and are used to facilitate loading and unloading of work on the table. Another example is that of a 4-spindle gang drilling and boring machine which has been equipped with an overhead trolley system for returning the work holders to the loading station. It will be surprising if the coming year does not see additional applications of material handling equipment to high production tools.

Speeding up production has been approached also from several other angles, one being the application of indexing heads, particularly to drilling, boring or tapping machines. In heads of this type, the parts are placed in an opening in the die head and pass automatically under the drill. With the operation completed, the drill spindle is withdrawn and the head rotates until the next blank is in position under the drill. The duties of the operator consist largely in loading and unloading the indexing head.

One vertical milling machine for boring and reaming cylinders introduced during the year is equipped with two roller conveyor sections mounted on a cradle. This cradle may be lowered to the horizontal position to receive cylinder castings from a conveyor line, and then tilted to enable the block to be moved over to the position on the work table. After the boring and reaming operations have been completed, the cradle is lowered to the point of alignment with the conveyors, permitting the finished casting to be removed and a new one

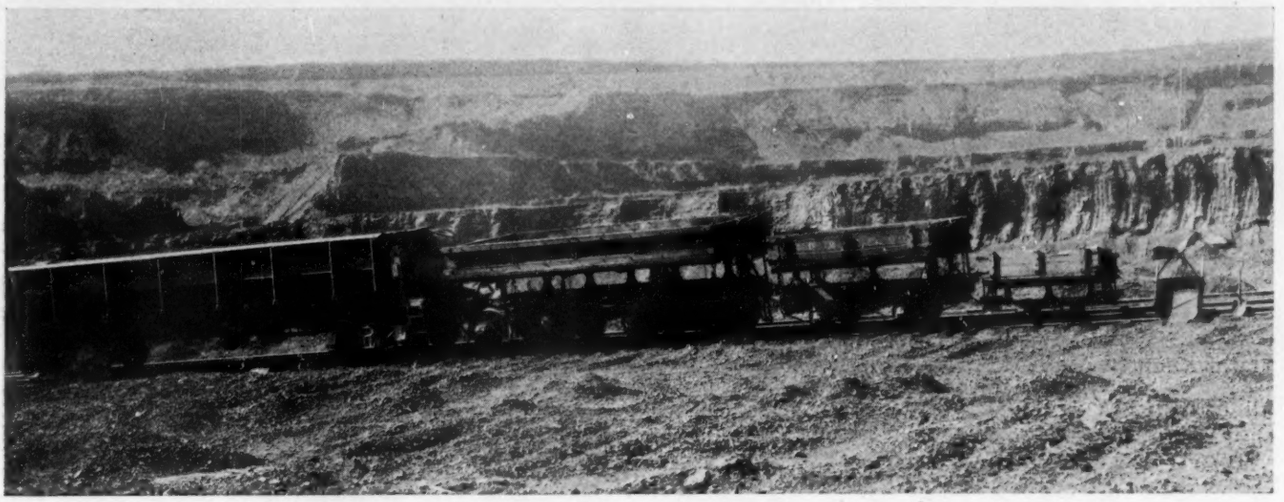
(*Concluded on Page* 117)

Annual Digest of Machine Tools (Concluded)

(Concluded from Preceding Page)

No.	Machine	Manufacturer	Issue	Page
	GRINDERS, Bench and Portable			
135.	Belt sander and grinder	Porter-Cable Machine Co.	7/3,	44
143.	Floor grinder	Cleveland Armature Works	7/3,	46
146.	Cylinder lapping machine	Reed-Prentice Co.	8/7,	362
158.	Abrasive band grinder	Walls Sales Corp.	8/7,	364
180.	Internal grinding machine	Heald Machine Co.	9/4,	611
200.	In-feed grinding machine	Cincinnati Grinder Co.	11/6,	1237
222.	Rotary surface grinder	Pratt & Whitney Co.	12/4,	1504
226.	Cutter and tool grinder	Wilmarth & Morman Co.	12/4,	1505
235.	Cylindrical grinding machine	Arter Grinding Machine Co.	12/4,	1507
	GRINDERS, Bench and Portable			
56.	Swing frame grinder	Excelsior Tool & Machine Co.	4/3,	927
83.	Electric bench grinder	Azor Motor Co.	5/1,	1176
104.	Swing frame grinder	Diamond Machine Co.	6/5,	1509
115.	Portable air grinder	Cleveland Pneumatic Tool Co.	6/5,	1511
136.	Electric bench grinder	Hisey-Wolf Machine Co.	7/3,	44
218.	Bench drill grinder	Connecticut Cutter & Machine Works, Inc.	11/6,	1241
	HOBBING MACHINES			
13.	Gear hobbing machine	Gould & Eberhardt	2/7,	427
70.	Spline hobbing machine	Sommer & Adams Co.	4/3,	930
167.	Two-spindle thread hobber	Pratt & Whitney Co.	9/4,	607
	LATHES; Automatic, Engine and Turret			
4.	Automatic screw machine	National Acme Co.	2/7,	424
38.	Geared-head lathe	Cincinnati Lathe & Tool Co.	3/6,	682
42.	Automatic bar machine	Budd-Ranney Engineering Co.	3/6,	683
93.	Automatic chucking machine	National Acme Co.	6/5,	1506
94.	13-inch lathe	Pratt & Whitney Co.	6/5,	1506
99.	Automatic lathe	Lodge & Shipley Machine Tool Co.	6/5,	1508
118.	Heavy duty engine lathe	Niles-Bement Pond Co.	7/3,	39
124.	Production lathe	Reed-Prentice Co.	7/3,	41
125.	4-spindle automatic	Cleveland Automatic Machine Co.	7/3,	41
128.	Chucking machine	New Britain Machine Co.	7/3,	42
149.	Bench lathe machinery	Pratt & Whitney Co.	8/7,	362
189.	Universal Turret lathe	Warner & Swasey Co.	10/2,	887
190.	Hollow spindle lathe	Reed-Prentice Co.	10/2,	887
233.	Universal turret lathe	Warner & Swasey Co.	12/4,	1507
237.	Hand centering machine	Pratt & Whitney Co.	12/4,	1508
	MILLING MACHINES			
10.	Rod milling machine	Niles-Bement-Pond Co.	2/7,	426
33.	Universal milling machine	Hendey Machine Co.	3/6,	681
52.	Hand milling machine	Pratt & Whitney Co.	4/3,	926
105.	Thread milling machine	O. S. Bickford & Son Co.	6/5,	1509
108.	Double spindle milling machine	Rockford Milling Machine Co.	6/5,	1510
145.	Universal hand miller	Pratt & Whitney Co.	8/7,	361
	PLANERS			
84.	120-inch planer	Betts Machine Works.	5/1,	1176
157.	Milling attachment for planers	Up-To-Date Tool Co.	8/7,	364
	SAWS			
132.	Metal cutting band saw	Stockbridge Machine Co.	7/3,	43
159.	Cut-off machine	Cochrane-Bly Co.	8/7,	364
	SHAPERS			
95.	Tool-room shaper	Cincinnati Shaper Co.	6/5,	1506
119.	32-inch crank shaper	Stockbridge Machine Co.	7/3,	39
177.	6-inch vertical shaper	Pratt & Whitney Co.	9/4,	610
	SLOTTERS			
116.	Planer-type slotter	Betts Machine Works.	6/5,	1511
	SMALL TOOLS			
7.	Pipe wrench	Ever-Grip Wrench Co.	2/7,	426
12.	Bench vise	Simplex Tool Co.	2/7,	426
29.	Ground taps	Jones & Lamson Machine Co.	3/6,	680
44.	Steel parallels	L. S. Starrett Co.	3/6,	684
80.	Expanding reamer	Lambert Tool Co.	5/1,	1174
103.	Rotary tap	Geometric Tool Co.	6/5,	1509
142.	Wrench	Speednut Wrench Corp.	7/3,	45
192.	Reverse taper die head	Landis Machine Co.	10/2,	887
	MISCELLANEOUS			
148.	Bushing press	Southwark Foundry & Machine Co.	8/7,	362
150.	Power press	General Mfg. Co.	8/7,	363
155.	Shield for grinder operators	Dreis & Krump Mfg. Co.	8/7,	364
195.	Drill table and vise	Modern Machine Tool Co.	10/2,	888
204.	Electric screw driver	Hisey-Wolf Machine Co.	11/6,	1238

Progress: ***This exhibition of equipment staged recently in the Mahoning mine of Pickands, Mather & Co., illustrates a feature of the development of the Lake Superior iron ore district, within a generation. In 1893 and prior the hand shovel and 9-cubic-yard hand scrapers were the utensils generally employed. Then came one-yard dump cars, used from 1894 to 1900: 5-yard cars from 1900 to 1914: 12-yard cars 1914 to 1920. Thirty-yard cars now are used. The march of progress in this span of years is striking in all other lines of iron ore development.***



New Era in Iron Ore Industry; Trade Outlook Bright

BY A. J. HAIN

A MUCH larger volume of business will be transacted by Lake Superior iron ore producers in 1925. Shipments will be increased to fill a demand that is already on the upgrade, and it is believed prices will be higher. The acceleration of mine operations now noted in the Lake Superior district is an indication of the confidence of producers.

Following the dull season of 1924 stocks of iron ore at lower lake docks and furnaces are less than at this time a year ago. The stocks Dec. 1, 1924, amounted to 40,000,000 tons; on the corresponding day of 1923 the total was 42,836,466 tons, and in 1922, 44,400,201 tons.

Based on present furnace operations, and allowing conservatively for an increase during the winter, the stocks probably will be about 3,000,000 tons below normal at the opening of navigation in the spring.

As compared with 43,900,000 tons in 1924, the shipments for 1925 are now expected to reach 55,000,000 or 60,000,000 tons. The total might conceivably be larger, depending upon a continuation of the present improvement in actual business and prospective orders. There has been a tremendous pig iron movement and there has not been, nor is there at present any indication that there will be soon a corresponding increase in the number of blast furnaces that will be lighted. Consequently pig iron stocks are almost certain to be much reduced by the end of the first quarter of 1925, and the indication is that pig iron prices will continue to improve.

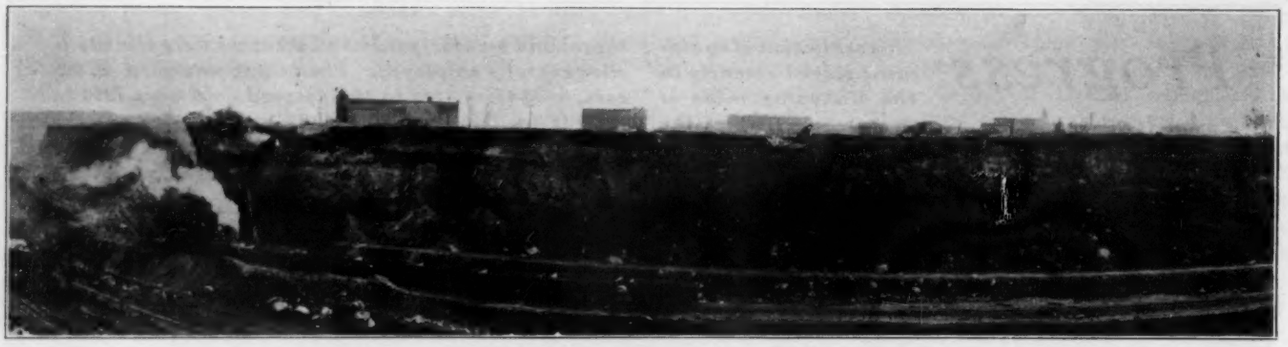
Approximate Shipments by Ranges

	—Gross tons— 1923	1924
*Mesabi	41,814,463	28,825,958
*Vermillion	1,278,598	933,760
*Cuyuna	2,220,745	1,295,072
Total Minnesota.	45,313,806	31,054,790
*Gogebic	6,579,950	4,807,565
*Marquette	3,892,666	2,963,000
*Menominee	4,854,781	3,798,217
Mayville, etc.	138,800	135,000
Misc. shipments, all rail	†	1,150,000
Grand total	60,780,003	43,908,572

*Includes lake shipments only in 1924.

†Absorbed in range figures for 1923.

As customary at this time of the year, and especially in view of the changed conditions since the election, furnace interests are speculating as to the probable price for iron ore in 1925. Nothing now indicates or supports a belief that prices will be anything except higher, and the question would seem to be only how much higher they may be in 1925 than in the season just closed. Operating and producing costs on the ranges are no lower, and in some respects are higher. Many mines operated at a loss during 1924. With the larger volume of business that is expected in 1925, and the higher prices for pig iron, finished and semifinished steel products that are being obtained



LAST DAYS OF "OLD HIBBING"

Many years of preparatory work by Oliver Iron Mining Co. in acquiring mineral and surface rights, in building a new and modern town farther south, and removal of buildings, finally has resulted in steam shovels stripping the north 40 acres of Hibbing. This is "old Hibbing" as it appears today from the Hull-Rust mine

it is reasonable that the ore producers should expect to receive more.

In the beginning of 1924 considerable tonnages of ore were in stockpiles in the Lake Superior district. It is not true, however, that these piles are larger today than they were at the beginning of the season. On the contrary stockpiles at the mines are not as large now as they were a year ago, as the tendency during the past season was to ship from stockpile wherever possible, leaving an opportunity for operation of the underground mines during the winter.

One of the largest producers in the Lake Superior region, who customarily maintains large stockpiles, has been able not only to ship the production from the mines during the summer, but also to ship somewhat from these stockpiles, so that in this particular instance the situation is improved The foregoing statements apply practically to all grades of ore produced from the Lake Superior ranges, although in the case of manganiferous ores such stockpiles are notably small and excess stocks of this character of ore do not exist.

The difficulty with the Lake Superior iron ore industry principally is its over development. It could readily produce 100,000,000 tons annually, while 60,000,000 tons is the consumption in a normal year. The stimulus of the war needs had a great deal to do with this; as also the desire of the large steelmaking interests to protect their sources of supply. High rates of taxation have forced some action. The investment in developed ore property involves tremendous overhead expense, and in a lean year considerable loss is sustained. The problem evidently will not be solved until iron and steel capacity is brought up to ore capacity, or the latter is brought down to the level of the former. At present they are out of line, and the result is an unsettled market situation.

Despite this over development efforts continually are in progress to put more ore bodies on a productive basis, mainly due to their intrinsic or prospective value, the known supply being limited. The reason for some development may be understood from the following: The independent mine operators have not had the co-relating influence that has benefited the Steel corporation's subsidiary. It has not been a matter merely of controlling mines—but the right kind of mines, with respect to quality of ore. With consolidated organization, skill in selecting, and financial means, the subsidiary has pieced together a remarkably efficient property. As the ore naturally high grade is consumed, and inequalities in structure and contents become more pronounced it can enrich or balance various grades with one another. It is believed the company can do this and continue to ship iron ore up to its present high standards sufficient for the estimated requirements of 40 years.

The joint interest or participating partnerships among the independent steel interests, whereby uniformly high grade ore is shipped to them, safeguards them for the present. Certain advantages and disadvantages are revealed. In 1924 it was necessary for a number of independents to close their own mines, because of their participation in other properties requiring them to take specified amounts. Some of the independent iron ore sellers view these participating interests as unfavorable to them, because it removes the consumers from the general market. Such agreements with fee owners have provided for heavy extraction of ore annually. The result is that certain mines with high grade material have been gouged out, and they are within a few years of depletion.

With business good for the next four years, this will tide the ore sellers over until such time when more consumers are required to buy their ore in the open market. Some sellers making such a forecast are positive a new and better era is beginning for them. They believe a great change in methods is coming in a few years. Certainly their opportunities and advantages for arranging for participations will be enhanced. The logical sequence seems to point to more participa-

Minnesota Ore Reserves and Assessed Values

Ore in Ground

County	Tons May 1, 1923	Assessed Value May 1, 1923	Tons May 1, 1924	Assessed Value May 1, 1924
St. Louis	1,120,078,655	$252,189,536	1,124,267,278	$257,450,841
Itasca	138,945,184	18,871,226	154,389,296	19,236,497
Crow Wing	42,538,241	3,752,290	45,733,970	3,614,515
Lake	50,978	.....	.....	.....
Totals	1,301,613,058	$274,813,052	1,324,390,544	$280,301,853

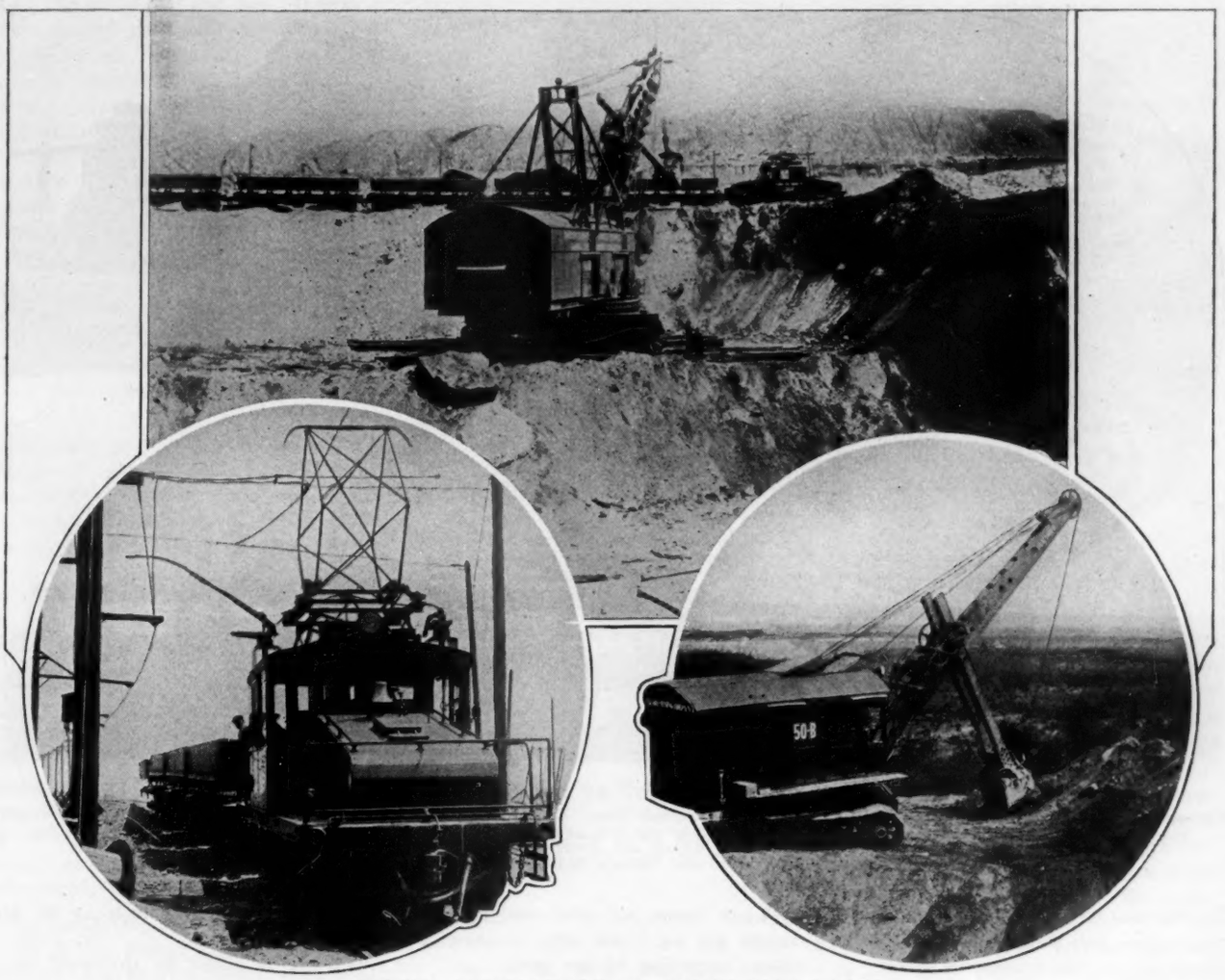
Ore in Stockpiles

St. Louis	9,168,123	$ 8,945,814	9,512,598	$ 7,737,524
Itasca	357,841	616,139	347,907	464,853
Crow Wing	502,859	617,425	387,051	417,229
Lake	.....	.....	.....	.....
Totals	10,028,823	$ 10,179,378	10,247,556	$ 8,619,606

Total Merchantable Ore in Ground and Stockpiles

St. Louis	1,129,246,778	$261,135,350	1,133,779,876	$265,188,365
Itasca	139,303,025	19,487,365	154,737,203	19,701,350
Crow Wing	43,041,100	4,369,715	46,121,021	4,031,744
Lake	50,978	.....	.....	.....
Totals	1,311,641,881	$284,992,430	1,334,638,100	$288,921,459

The assessments as given in this table do not include the assessments for surface values, structures or improvements.



MINING ELECTRICALLY ON MESABI IRON RANGE

The 60-ton electric locomotive has replaced a 67-ton steam locomotive. The locomotive is shown hauling a 5-car train. A steam locomotive, though 7 tons heavier on the drivers, could handle only four cars on the same grade. The electric shovel is of the 320-ton type. Below is a 50-ton electric shovel mounted on caterpillars

tions as available supplies are reduced.

As for the immediate outlook: A contract for a mine stripping job involving nearly $1,000,000 was awarded a few weeks prior to election, subject to a clause giving the maker the option of canceling it by Nov. 15. The contract now is in force, and an entirely new enterprise in the mining and treating of ore has begun.

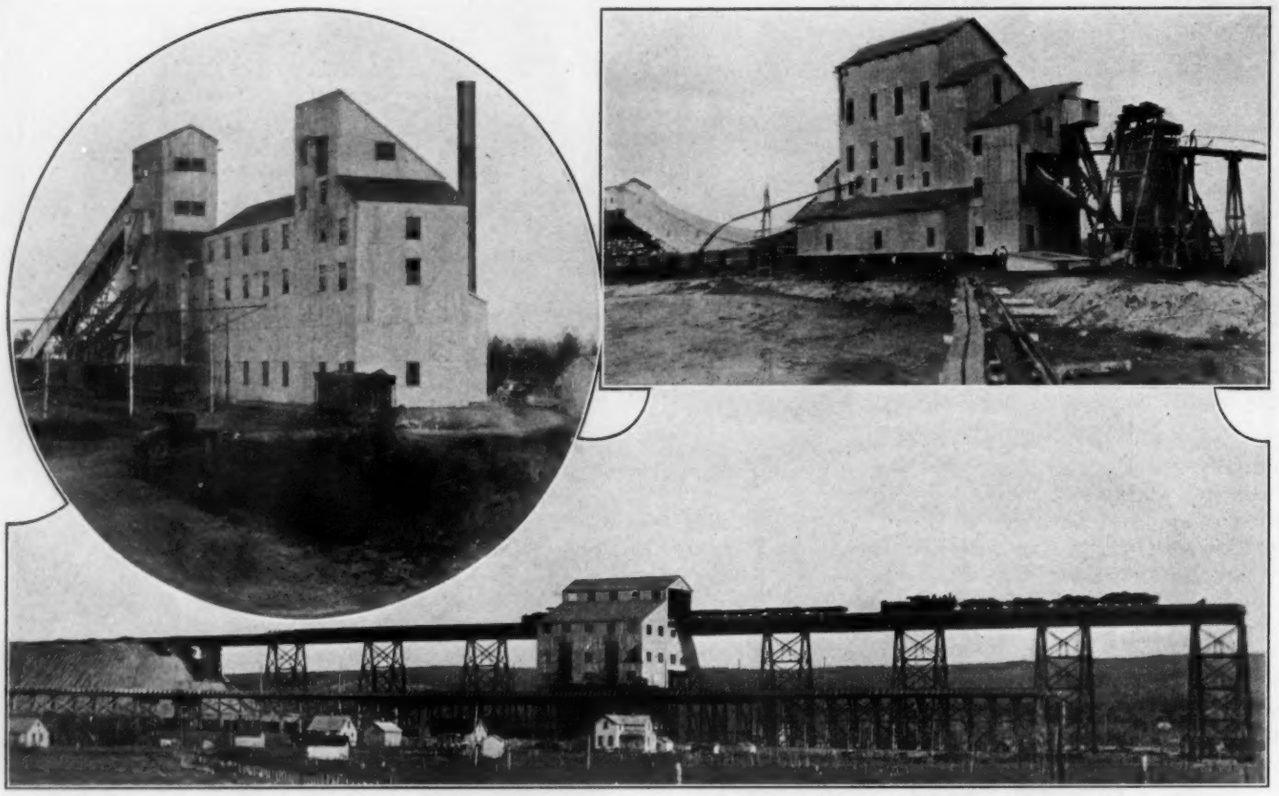
Reference has been made from time to time to the efforts of the Ford Motor Co. to obtain additional supplies of iron ore in the form of reserves or mines. For the past two years extensive explorations have been conducted by the company in the Lake Superior country on property acquired through an extensive purchase of hardwood and mineral lands about four years ago. To date, however, so far as is known, no ore of merchantable character in any sizable tonnages has been disclosed. The question may be asked why the Ford company wishes any large reserves of ore, as the policy of the company apparently has never been to dispose of its excess supply of raw materials in the market but to reserve them for its own use in the future.

An analysis of the situation as regards its ore supply would indicate that the same kind of policy would apply. At present the company has two large modern stacks at the River Rouge plant, near Detroit. Under normal conditions most of the pig iron produced in these furnaces is used in the company's own foundries, with perhaps a slight excess going to parts makers, on contracts. In a particularly poor year the situation is a little different and more of such iron is either stocked on the furnace yard or goes to parts makers. At only one time within the past four years has Ford iron really gone on the market. However, the Ford company is building a steel plant, and one of fair size. Only recently it was announced that it had awarded contracts for four-open hearth furnaces and that in addition to these the company would itself build 16 more furnaces of the same sort.

This is an indication of the amount of pig iron that the Ford steel plant developments will require. It is understood the ultimate layout of the Ford plant at River Rouge provides for five blast furnaces. For any such expansion as this additional ore reserves would be necessary in view of the fact that the only producing mine which the Ford company has today is the Imperial on the Marquette range, from which approximately

Ore Shipments by Ports and Railroads

	—Gross tons— 1923	1924
Escanaba		
C. & N. W.	3,793,620	2,952,549
C. M. & St. P. ..	1,813,791	1,292,120
Marquette		
D. S. S. & A. ..	848,303	1,051,996
L. S. & I.	1,940,982	1,464,552
Ashland		
C. & N. W.	4,910,704	3,526,117
Soo Line	1,326,745	1,281,448
Superior		
Great Northern ..	15,725,552	12,060,142
Soo Line	1,375,138	670,877
Northern Pacific ..	719,787	624,195
Duluth		
D. M. & N.	20,163,619	12,882,082
Two Harbors		
D. & I. R.	6,418,464	4,817,494
Total	59,036,075	42,623,572
1924 decrease	.....	16,412,503



MORE ORE MUST BE CONCENTRATED

The plant, upper left, is the first sintering installation on the Cuyuna range. Concentration is accomplished by driving off excess moisture and volatile matter. The plant at the right is that referred to in the text as the first of its type erected in the Lake Superior district for jig concentration of high-silica ore. Below is a crushing and screening plant just built by the Steel corporation's subsidiary at Virginia, Minn.

200,000 tons of ore is produced annually, or only one-half the annual requirements of one of the two present furnaces.

Pertaining to developments in the Lake Superior mining district, the most important are those relating to the special treatment of ore to make it merchantable. The $5,000,000 magnetic separating plant on the eastern end of the Mesabi range was unable to operate under the market conditions of 1924. This plant is a success from an engineering standpoint, but the demand for ore was not sufficient to sustain it. Low prices would not have been a deterring factor had there been a greater volume of business, although low prices and restricted demand generally go hand in hand. Less significance is attached to the matter when it is appreciated that more than 50 per cent of the operating capacity on the ranges was idle.

Foremost in importance is the fact that in mines on the western end of the Mesabi range the percentage of silica has become abnormally high. This probably affects 100,000,000 tons of ore, hitherto considered merchantable as mined, or practically so. Attention was directed pointedly to the matter when the Oliver Iron Mining Co. canceled its lease of the Canisteo mine, because the company was unable to remove the excess silica by the usual washing process. Other mines similarly are involved. The proportion of silica in some of the ore has increased 2½ to 3 per cent, in some instances exceeding 15 per cent.

The structure is somewhat different from the ordinary wash ore. Twenty-two washing plants now on the Mesabi range use the same general type of log washers. A new method is considered necessary to remove the silica from the ore found in the western area.

The plant of the Stanley Mining Co. is the first in the Lake Superior district to use jigs in the separation of ore from the silica, somewhat in the manner of the process used extensively in the separation of zinc and lead.

The deposit at the company's Mary Ellen mine is mainly a banded hematite. The ore is of good grade, but mixed with considerable sand. Some taconite also is found in the pit. The material as mined runs approximately 42 per cent iron and 32 per cent silica, and phosphorus varies, corresponding to both bessemer and nonbessemer grades.

The overburden is about 20 feet deep, and the ore body is of similar depth. It is believed to contain sufficient material for 700,000 tons or more of concentrates. About 50,000 tons were shipped in 1924. The plant is electrically operated and has capacity for about 75 tons of concentrates per hour. It uses 500 gallons of water per minute, pumped from a neighboring lake. The recovery of iron units runs as high as 80 per cent.

The ore is mined by the usual open pit shovel method and hauled to a trestle incline from where the cars are pulled up one at a time. It is dumped onto grizzlies and passes to the gyratory crushers. From these it goes to classifiers, washers and jigs.

After passing through the washers it yields a product running about 52 per cent iron and 17 per cent silica. The final concentrates approximate 58.50 per cent iron; 9.80 per cent silica; 0.04 phosphorus, 4.0 per cent moisture and 56.16 per cent iron natural. Samples show 56 to 60 per cent iron; 7.50 to 14.11 per cent silica, and 0.021 to 0.114 phosphorus. The concentrates are of comparatively uniform size, the largest being about 1½-inch.

The Evergreen sintering plant of the Minnesota Sintering Co., at Crosby, Minn., Cuyuna range, also is the first of its kind in the Lake Superior district. Sintering, however, is part of the process in use at the magnetic separating plant of the Mesabi Iron Co.

The ore body is controlled by the Evergreen Mining Co., whose officers are the same as those of the sintering company. The plant is completed and has been operated with ore from an adjacent pit. A contract recently was awarded for stripping 2,500,000 cubic yards overbur-

den. The ore is soft and fine. It first is screened, and that over ¼-inch size is shipped direct, while the smaller size will be sintered. The finer material contains about 40 per cent iron. In sintering, the proportion of iron can be raised to about 60 per cent, through expulsion of moisture and other volatile matter The plant's capacity is 500 tons of sinter per day

Increased facilities for crushing and screening are a feature of current developments on the Mesabi range. The Oliver Iron Mining Co. has just built a plant in the Virginia district. It operates with two 60 x 48-inch jaw crushers.

The company by stripping has greatly enlarged the capacity of the Minnewas and Mesabi Mountain mines, state-owned properties. The new plant ties in with this development. Work has been started on a two-unit crushing and screening plant at Hibbing to serve the Hull-Rust pit. Construction of 10 miles of new trackage is part of the latter enterprise.

Great progress is being made in electrification of equipment everywhere in the Lake Superior district. This has become more pronounced with the increase in capacity made by commercial power companies. Scores of underground mines are being equipped with electric apparatus, and in the open pits are many more electric shovels than a year ago.

The installation at the Wabigon mine of the M. A. Hanna Co, Mesabi range, comprises the first complete electrification of an open pit iron ore mine. Power at 20,000 volts, three-phase, 60 cycles is purchased from a commercial power company. A bank of three single-phase transformers steps down the incoming voltage to 2200 for the use of the shovels, and six transformers in two banks step down the incoming voltage to 445 for the synchronous converters which supply 600 volts, direct current for locomotives.

An overhead trolley system is used for supplying power to the haulage equipment. On main tracks and ore yards the trolley wire is suspended over the center of the track, and on loading tracks in front of the shovels and on dumps the trolley wire is installed at the side at a distance of 10 feet from the center of the track, and 15 feet above the rail. The latter method was devised because a center trolley wire would interfere with the shovel dipper when loading. The trolley wire installation at these points is of a temporary nature, as the tracks are continually shifted, and therefore the supports for the wire must be portable, and easily shifted with the track.

The locomotives are three 60-ton, General Electric Co. swivel truck type designed to operate at 500 volts direct current, and having capacity for hauling a train of 340 tons, including locomotive, up a 3 per cent grade tangent track at 7.5 miles per hour. Each locomotive is operated with an air operated pantagraph sliding bow collector mounted on the cab roof for use on main tracks, and with two air operated side arm collectors mounted on either side for use with side trolley wire on loading and dump tracks.

AN INCREASED DEMAND FOR MANGANIFEROUS ORE WAS NOTED IN 1923 RESULTING IN THE SHIPMENT OF APPROXIMATELY 250,000 TONS FROM THE SAGAMORE MINE. THE SHOVELS ARE ELECTRICALLY OPERATED

The electric shovel equipment consists of one Marion type 300 E and one Bucyrus type 50 B, both machines being equipped with General Electric Co. direct current motors operated from motor generator sets. The model 300 E has full field control and in the 50 B the control is partially rheostatic. The power supply is carried at 2200 volts, 3-phase, 60 cycles on a pole line into the pit, and conveyed to the shovels by means of flexible cables. The complete installation was developed by R. S. Walker, consulting engineer, M. A. Hanna Co.

The Oliver company is completely electrifying the Soudan mine, an underground property on the Vermillion range from which ore has been produced during the past 40 years. The company's Philbin, Higgins-McEwen, Spruce and Leonidas mines, Mesabi range, also are being electrified. The company was one of the pioneers in the extensive electrification of the underground mines on the Gogebic range, where many of the shafts are down below sea level.

Pickands, Mather & Co. are electrifying the Sunday Lake mine, Gogebic range, and installing electric haulage equipment at the Penn group of mines, Menominee range. It has completed electrification of the Caspian and Baltic mines on the Menominee. A list of companies using electric power equipment includes practically all of the operators in the Lake Superior district. It is a comparatively new development, with every indication of further rapid expansion.

Electric shovels of the 325-ton type are being tried out by Pickands, Mather in stripping at the Bennett mine. About 2,500,000 cubic yards of overburden will be removed. The company completed stripping at the Scranton mine and has made shipments from the new pit. This stripping job was one of the largest of its kind ever accomplished. Overburden was unusually deep, averaging 130 feet, and from the 80-acre area of the mine approximately 8,000,000 cubic yards of earth has been removed. Stripping at the Danube mine also has been completed with the removal of 2,000,000 cubic yards. These mines are on the Mesabi range. All the underground properties of the company in the Lake Superior district are active this winter. The company began in 1924 operating a number of mines in which the Youngstown Sheet & Tube Co. has a large interest.

While stripping of ore bodies, and deepening of shafts is quite general, some of the mines from which ore has been forwarded steadily for many years have become exhausted. Pickands, Mather's Belgrade, Mesabi range, is one of these. The Fay and Thorne mines, Mesabi range, M. A. Hanna Co. also are about depleted. The Salisbury and Francis mines, Marquette range, Cleveland-Cliffs Iron Co, have been closed permanently. Nearly 10,000,000 tons of ore has been removed from these mines, collectively.

The first underground manganiferous mine on the Cuyuna range to resume operations since the war started in 1924. This is the Manganiferous Iron Co.'s

(*Concluded on Page* 116)

World Tonnage Is Set for Rise

Although Aggregate Output Showed a Slight Decline Last Year, Conditions Both in America and Europe Indicate Record Breaking Activities in 1925—America Still the Dominant Factor

AMERICAN iron and steel production is now on the upgrade, but the turn in the tide came so late in the year that the total output in 1924 was considerably less than in 1923. While on the other hand European tonnage improved considerably last year, in the final summation the increase abroad was insufficient to counteract the shrinkage in the United States. This resulted in a net decline in the aggregate output of the world's mills and furnaces last year for the first time since 1921. According to the usual annual statistics compiled by IRON TRADE REVIEW through the aid of its globe-encircling editorial organization, the world's output of pig iron in 1924 was 64,630,000 gross tons, compared with 66,471,000 tons in 1923, 51,938,000 tons in 1922, and 34,700,000 tons in 1921. This latter figure represented the lowest point so far recorded in the twentieth century, the output in the last prewar year having been 77,182,000 tons.

Similarly, the world's production of steel ingots and castings last year was 73,575,000 gross tons, compared with 75,096,000 tons in 1923, 63,098,000 tons in 1922, 42,487,000 tons in 1921, and 75,019,000 tons in 1913.

This is the fifth consecutive year in which IRON TRADE REVIEW has collected exclusive statistics of total production. As shown in table I, a practically continuous record is now available covering an expanse of 11 years. These figures reflect clearly the difficulties with which the business of manufacturing iron and steel has been surrounded since the roof blew off in Europe over a decade ago. At no time in the intervening period has the world's pig iron output reached the prewar figure. The record of the steelmakers is much better, especially in the past two years. The tonnage of steel ingots and castings last year was 98 per cent of the prewar maximum while that of the preceding 12 months was 77,000 tons more than in 1913. Blast furnace tonnage in 1924 was only 84 per cent of that in 1913. Two years ago it was 86 per cent of the prewar output. Owing to the development of steelmaking processes using large quantities of scrap the production of steel is constantly becoming a more important factor than pig iron for gaging the general condition of business. Only a moment's consideration is necessary to reveal the significance of last year's aggregate steelworks effort as represented by a total of 73,575,000 tons for the whole world. It is within one and a half million tons of the prewar maximum, in spite of the fact that American output last year was over seven million tons less than in 1923.

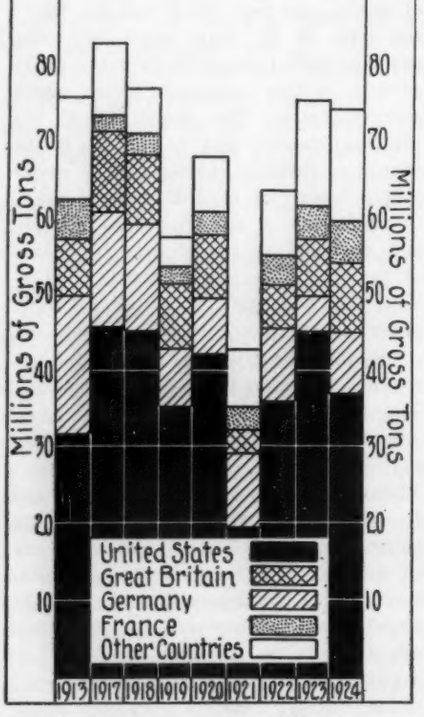


DIAGRAM SHOWING HOW STEEL PRODUCTION OF THE DIFFERENT NATIONS OF THE WORLD HAS VARIED IN THE PAST SEVERAL YEARS WITH AMERICA ALWAYS LEADING

These figures strongly silhouette the tremendous improvement which has taken place in Europe since the war. The advance in the Old World has been particularly rapid since the occupation of the Ruhr was brought to an end, thus releasing the energies of the Ruhr, Rhineland, and Lorraine plants. This great industrial region, which is second only in importance to our own Pittsburgh and Youngstown districts, cast and rolled about ten million tons of steel last year compared with only six million tons in 1923. The annual capacity of this district, however, is nearly twenty million tons. Current operations represent only about half of what might be accomplished. If this is considered along with the fact that American production is again on an upgrade, no special amount of foresight is necessary to realize that the world's pig and steel output has a better chance to smash all records this year than ever before. If a new high point is reached in 1925 it will be because of the gradual financial improvement which has been going on since the armistice, aided by the operation of the Dawes plan. European mills and furnaces made 33,675,000 tons of steel last year, compared with 27,952,000 tons in 1923, and 20,652,000 tons in 1919, the latter being the first year after the war. Current output is about 79 per cent of the prewar maximum. This is in spite of the fact that Russia, after huge communistic efforts, last year succeeded in contributing only 600,000 tons in 1913. Germany is now using only a little over half of her existing capacity. France on the other hand is coming to the front as one of the world's leading iron and steel producing nations. French production last year was 6,850,000 tons compared with 4,614,000 tons before the war. Little Belgium broke all records in 1924 with a steel

output of 2,850,000 tons. Europe's production of pig iron last year was 31,155,000 tons compared with 23,825,000 tons in 1923, and 18,539,000 tons in 1919.

America's contribution to the world total was less than usual in the year just closed. The pig iron production in the United States in 1924 was 48 per cent of the world's total, compared with 60 per cent in 1923, 51 per cent in 1922, and 47 per cent in 1921. Turning to steel production, we find that in 1918 the United States made 58 per cent of the world's total. The following year, the first after the war, the figure was 61 per cent, rising to 63 per cent in 1920 and falling with certain fluctuations to 51 per cent in the year just closed. This one nation, however, is still called upon to make over half of the world's steel and its production last year was four million tons over Europe.

What India, China, and Australia may do in the future no one now knows. It is significant, however, that the blast furnaces of India have doubled their output in the past seven years. Australia, saddled with a labor government, has not made as much progress and the pig iron production of this great continent hangs persistently around 300,000 tons per year. The Chinese iron industry, for a different reason, also is showing very little development. The Orient and the Antipodes combined have not yet been able to reach a pig iron output of two million tons per year. The same applies to steel. This is less than two per cent of the world's total. Yet these Eastern countries contain several hundred million more people than the Western nations. Their per capita consumption of iron and steel products is exceedingly low, even though their aggregate requirements are greatly in excess of their own production.

The World's Production of Iron and Steel

Before, During and Since the War—Gross Tons

Pig Iron

	1924	1923	1922	1921	1920	1919	1918	1917	1913
United States	31,000,000	40,026,000	26,851,000	16,506,000	36,401,000	30,579,000	38,437,000	38,165,000	30,653,000
Canada	700,000	909,000	404,000	617,000	999,000	863,000	1,107,000	1,086,000	1,015,000
Great Britain	7,400,000	7,440,000	4,902,000	2,616,000	8,035,000	7,398,000	9,086,000	9,322,000	10,260,000
France	7,500,000	5,346,000	5,147,000	3,308,000	3,380,000	2,374,000	1,286,000	1,707,000	5,126,000
Belgium	2,800,000	2,154,000	1,578,000	862,000	1,099,000	247,000	1,000	8,000	2,428,000
Luxemburg	2,125,000	1,384,000	1,650,000	955,000	682,000	608,000	.....	.....	.....
Italy	250,000	243,000	91,000	75,000	107,000	251,000	328,000	497,000	420,000
Spain	400,000	394,000	175,000	175,000	248,000	290,000	380,000	352,000	418,000
Sweden	300,000	273,000	255,000	304,000	477,000	501,000	766,000	843,000	730,000
Germany	8,200,000	4,400,000	8,000,000	6,096,000	5,568,000	6,192,000	11,672,000	12,931,000	19,000,000
Austria	[illegible]	339,000	317,000	211,000	96,000	61,000	.....	2,000,000	2,343,000
Czechia	[illegible]	750,000	339,000	532,000	699,000	617,000	.....	.....	.....
Poland	[illegible]	492,000	458,000	540,000	100,000	.....	.....	.....	.....
Hungry	[illegible]	295,000	246,000	50,000	30,000	.....	.....	.....	.....
Russia	[illegible]	315,000	125,000	115,000	15,000	.....	.....	1,500,000	4,486,000
Japan	50,000	300,000	300,000	200,000	168,000	206,000	178,000	121,000	56,000
China	375,000	375,000	400,000	600,000	.....	.....	.....	.....	.....
India	550,000	536,000	350,000	371,000	312,000	320,000	265,000	252,000	.....
Australia	300,000	300,000	250,000	318,000	257,000	236,000	177,000	147,000	47,000
Miscellaneous	200,000	200,000	100,000	149,000	181,000	100,000	68,000	100,000	200,000
World total	64,630,000	66,471,000	51,938,000	34,700,000	58,854,000	50,843,000	63,751,000	69,031,000	77,182,000

Steel Ingots and Castings

United States	37,800,000	44,944,000	33,603,000	19,744,000	42,133,000	34,671,000	44,462,000	45,061,000	31,301,000
Canada	725,000	885,000	485,000	669,000	1,109,000	928,000	1,695,000	1,562,000	1,043,000
Great Britain	8,400,000	8,482,000	5,881,000	3,703,000	9,067,000	7,894,000	9,539,000	9,717,000	7,664,000
France	6,850,000	5,024,000	4,464,000	3,010,000	3,002,000	2,151,000	1,780,000	2,196,000	4,614,000
Belgium	2,850,000	2,250,000	1,539,000	780,000	1,233,000	329,000	10,000	10,000	2,428,000
Luxemburg	1,850,000	1,182,000	1,368,000	747,000	561,000	360,000	.....	.....	.....
Italy	1,100,000	1,100,000	600,000	672,000	762,000	763,000	976,000	1,311,000	918,000
Spain	475,000	453,000	250,000	100,000	150,000	250,000	320,000	480,000	381,000
Sweden	400,000	294,000	343,000	203,000	430,000	483,000	536,000	572,000	582,000
Germany	8,500,000	5,900,000	9,000,000	8,700,000	6,624,000	7,648,000	14,738,000	16,322,000	18,631,000
Austria	550,000	491,000	473,000	329,000	196,000	.....	.....	2,872,000	2,584,000
Czechia	800,000	1,000,000	630,000	504,000	958,000	774,000	1,003,000	.....	.....
Poland	950,000	935,000	930,000	1,476,000	60,000	.....	.....	.....	.....
Hungary	350,000	344,000	295,000	90,000	40,000	.....	.....	.....	.....
Russia	600,000	492,000	212,000	161,000	45,000	.....	.....	2,000,000	4,760,000
Japan	550,000	500,000	500,000	558,000	301,000	295,000	328,000	364,000	13,000
China	200,000	200,000	150,000	150,000	.....	.....	.....	.....	.....
India	225,000	215,000	175,000	182,000	156,000	187,000	184,000	163,000	.....
Australia	200,000	200,000	100,000	209,000	167,000	178,000	142,000	150,000	.....
Miscellaneous	200,000	200,000	100,000	100,000	151,000	200,000	300,000	410,000	100,000
World total	73,575,000	75,096,000	63,098,000	42,487,000	67,145,000	57,111,000	76,013,000	83,190,000	75,019,000

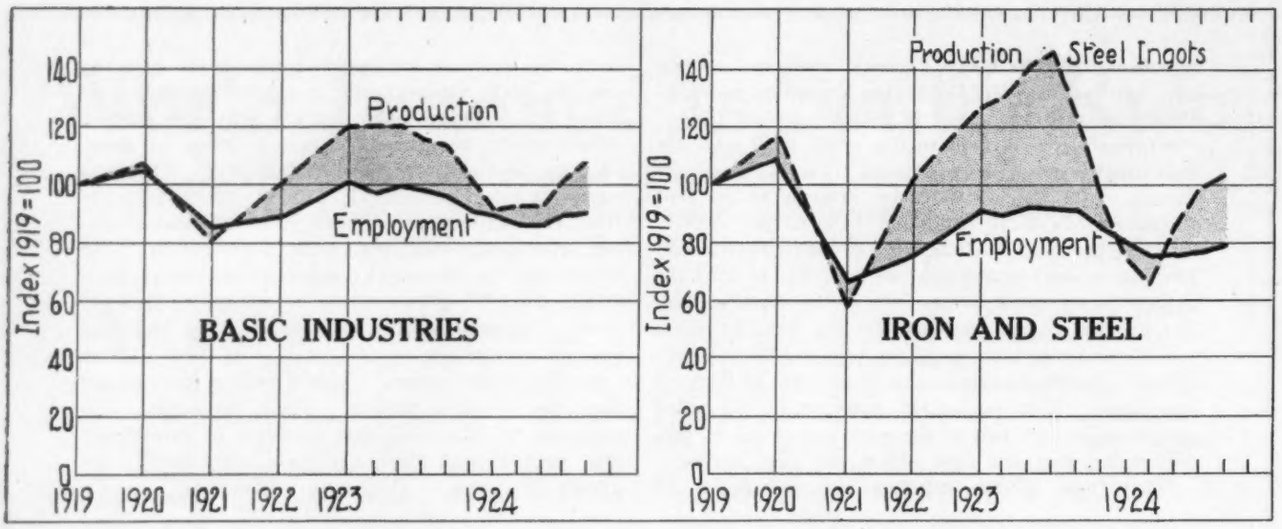
Figures for Germany include Luxemburg prior to 1919; figures for Austria prior to 1919 include the major portions of Czechia and Hungary; Poland's production prior to 1919 is covered in the figures for Germany and Russia; since 1920 Poland's figures include most of Upper Silesia.

Exports and Imports of the Principal Countries

Gross Tons—Scrap Eliminated

	Exports					Imports				
Country	1924	1923	1922	1921	1913	1924	1923	1922	1921	1913
United States	1,811,000	1,929,500	1,992,700	2,150,300	2,746,000	493,000	582,800	733,300	135,800	317,000
Great Britain	3,843,000	4,319,700	3,401,100	1,696,500	5,049,000	2,480,000	1,321,800	881,800	1,640,000	2,231,000
Germany	1,216,000	1,339,500	2,516,400	2,110,000	5,664,000	874,000	1,732,200	1,861,200	621,400	284,000
France	2,595,000	2,184,400	1,968,000	1,524,500	578,000	714,000	704,400	771,600	434,800	155,000
Belgium (b)	3,290,000	2,501,600	1,715,700	903,600	1,546,000	530,000	546,100	503,100	514,200	827,000
Total	12,755,000	12,274,700	11,593,900	8,390,700	15,583,000	5,091,000	4,887,300	4,751,000	3,346,200	3,814,000

(b) Includes Luxemburg from July 1, 1922.



Employment and production in the iron and steel industry, and in basic industries, indicating the changes in per capita output

Wages Remaining at High Level

General Average in Manufacturing Industries Is 100 Per Cent Above 1914, and Close to Pinnacle of Last Ten Years—Increasing Employment May Bring Some Further Advances—What the Record of 1924 Shows

AFTER a year marked by at least eight months of declining industrial operations and employment, wages remain substantially on the same high plane as 12 months ago. They are approximately 100 per cent above the level of 1914, an average of 10 points having been added for each of the last ten years. They still are close to the pinnacle attained when war-time activities were at maximum.

Having resisted the effect of an industrial depression, the inference is they cannot be expected to drop on the eve of or during a period of prosperity. They might be considered as displaying a tendency to proceed upward, in accordance with rising demand for labor. While this is anticipated in some industries, where fractional reductions were made during the dullest months of 1924, a general advance is not in prospect. It will not be a subject for serious consideration until the available supply of labor is absorbed, and there ensues a scarcity. The law of supply and demand, apparently, nodding in 1924, certainly will assert itself in the matter of further wage increases; only the most pressing requirements will favor them.

In practically all lines of manufacturing the complaint is heard that not enough men are entering and becoming proficient at the trades. This is true, notwithstanding the many special inducements now being offered. Some observers view this as a disconcerting factor, that will be more pronounced as business improves. The same fear is expressed regarding common labor, restricted by the immigration quota law. They believe the supply of skilled and unskilled labor is not sufficient for more than normal operations.

The following points are believed to justify an opinion wages will continue at present high levels or move upward; Good business ahead, with consequent greater demand for labor, and strong trade union agreements in such basic industries as building trades, coal mining, and railroad transportation.

Commenting on the fact that average living costs are up only about 60 per cent, when compared with 1924, the National Industrial Conference board, draws a remarkable picture of the average working man's prosperity. Emphasis is placed on the importance of "real" earnings, because of rapidly shifting money values during the last decade. The board states:

"In September, 1924 the cost of living index number determined by the

Wage Changes Based on Selling Prices

Amalgamated Association of Iron, Steel and Tin Workers' Scale

	Percentage advance at peak over 1914	Percentage advance in Nov.-Dec. 1923 over 1914	Percentage advance in Nov. Dec. 1924 over 1914
Sheet mill workers	109.5	48	39
Tin mill workers..	96.5	48	39
Bar mill workers			
Puddling	235.0	139	112
Cinder bottom:			
Heavy scrap ...	271.0	135	103
Light scrap	253.0	125	96
Cast swarth	250.0	124	94
Sand bottom:			
Heavy scrap	212.0	101	72
Light scrap	271.0	135	112
Muck rolling ...	227.0	111	90
Piling on boards.	138.0	66	51
Heating	174.0	81	61
Guide mill	137.0	67	52
Average, bar mill.	216.8	108	84

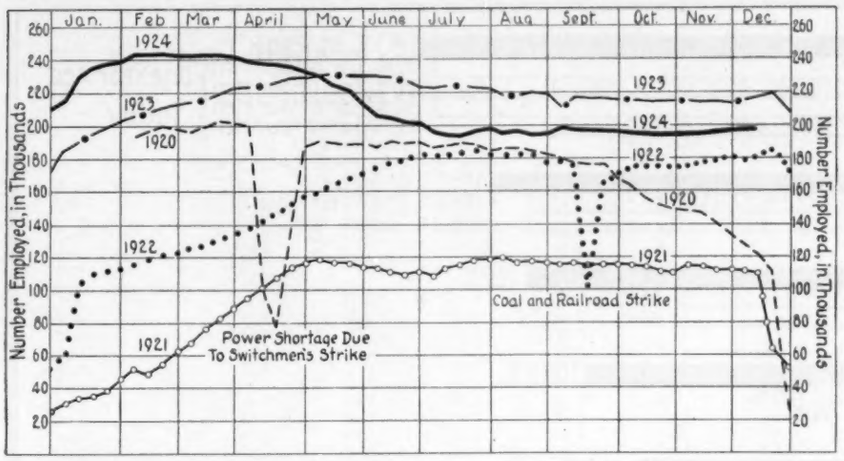
Corporation's Rates for Common Labor

	Wages for 10 hrs.	Per cent advance	Per cent advance over 1915
1915	$2.00	..	..
Feb. 1, 1916	2.20	10	10
May 1, 1916 ..	2.50	13.6	25
Dec. 15, 1916 ..	2.75	10	37.5
May 1, 1917 ..	3.00	9	50
Oct. 1, 1917 ...	3.30	10	65
April 16, 1918 ..	3.80	15	90
Aug. 1, 1918 ..	4.20	10.5	110
†Oct. 1, 1918 ..	4.62	10	131
†Feb. 1, 1920 ..	5.06	10	153
†May 16, 1921 ..	4.05	*20	102.5
July 16, 1921 ..	3.70	*8.6	85
Aug. 29, 1921 ..	3.00	*18.9	50
Sept. 1, 1922 ..	3.60	20	80
April 16, 1923 ..	4.00	11	100
††Aug., 1923 ...	4.40	10	120

*Reduction.

†Basic 8-hour day in effect; time and one-half for overtime.

††Twelve-hour day abolished. Labor placed on 8-hour shift paid at rate of 50 cents an hour.



FIVE YEARS OF EMPLOYMENT

This chart prepared by the Employers' Association of Detroit shows the number of persons employed by firms whose employing strength represents two-thirds of the total in that city and suburbs

board stood 63.7 per cent above the level of July, 1914 as compared with 63.4 per cent in September, 1923. During the year ending September, 1924 hourly earnings of all wage earners remained practically constant. There was, therefore, no considerable change in 'real' hourly earnings during the year. The highest point reached, during the last ten years by the index number of 'real' hourly earnings based on conditions in July, 1914 as 100, was 142 and the lowest point 139. In September, 1924 it stood at 141. The substantial increase in actual weekly earnings between August and September of this year advanced the index number of 'real' weekly earnings to 126 for the month in spite of the fact that the cost of living index number had also advanced nearly a point. Translated into other terms it means, that in September, 1924 the contents of the average employed wage earner's pay envelope would purchase 26 per cent more of the necessaries of life than in July, 1914."

In practically every important industry within the general scope of iron and steel, wage rates are about equal to those of a year ago. With an increase in the number of hours worked earnings will continue to gain. Wage rates for union molders in 11 districts are the same as a year ago, with one exception. The rate in the Detroit district was $6 for eight hours a year ago; it now is $7.20. The rate in the New Orleans district went up from $6 to $6.40, during the year, but in December was restored to $6.

The National Metal Trades association issues monthly reports of wages paid by its members in the five districts where they are located. Thirty-three cities are represented. The wages are those paid in the members' machine shops; foundries and patternshops, to those workers on an hourly basis.

Advance in Union Molders' Wage Rates

	Rates prior to war, 1914	Postwar Peak	Rates one year ago	Rates Dec. 1, 1924
BOSTON:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$7.20 for 8 hours 131.9% over prewar	$7.20 for 8 hours 131.9% over prewar
CHICAGO:	$4.00 for 9 hours	$8.40 for 8 hours 136.4% over prewar	$8.00 for 8 hours 125.2% over prewar	$8.00 for 8 hours 125.2% over prewar
CINCINNATI:	$3.50 for 9 hours	$7.00 for 8 hours 125.5% over prewar	$7.00 for 8 hours 125.5% over prewar	$7.00 for 8 hours 125.5% over prewar
DETROIT:	$3.50 for 9 hours	$8.50 for 8 hours 173.7% over prewar	$6.00 for 8 hours 93.2% over prewar	$7.20 for 8 hours 131.9% over prewar
MINNEAPOLIS:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$6.16 for 8 hours 98.4% over prewar	$6.16 for 8 hours 98.4% over prewar
NEW ORLEANS:	$3.25 for 9 hours	$7.20 for 8 hours 149.3% over prewar	$6.00 for 8 hours 109.7% over prewar	$6.00 for 8 hours 109.7% over prewar
NEW YORK CITY:	$3.75 for 9 hours	$7.04 for 8 hours 111.5% over prewar	$8.00 for 8 hours 140.3% over prewar	$8.00 for 8 hours 140.3% over prewar
PITTSBURGH:	$4.00 for 9 hours	$7.50 for 8 hours 111 % over prewar	$7.50 for 8 hours 111 % over prewar	$7.50 for 8 hours 111 % over prewar
ST. LOUIS:	$3.50 for 9 hours	$8.00 for 8 hours 157.7% over prewar	$7.50 for 8 hours 141.3% over prewar	$7.50 for 8 hours 141.3% over prewar
CLEVELAND:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$7.20 for 8 hours 131.9% over prewar	$7.20 for 8 hours 131.9% over prewar
INDIANAPOLIS:	$3.50 for 9 hours	$7.20 for 8 hours 131.9% over prewar	$7.00 for 8 hours 125.5% over prewar	$7.00 for 8 hours 125.5% over prewar

A comparison of the reports from the individual cities as well as the averages for their respective districts shows extremely small variation during the past year. This also is true with respect to hourly earnings which are slightly higher than the hourly rates, in each district.

An accompanying table gives the hourly rates in detail for the past year and one-half. In January 1924 the general average of the hourly rates was 54.6 cents. In October, the rate was 55.7 cents. The difference between the minimum and maximum monthly averages in that period was 1.3 cents.

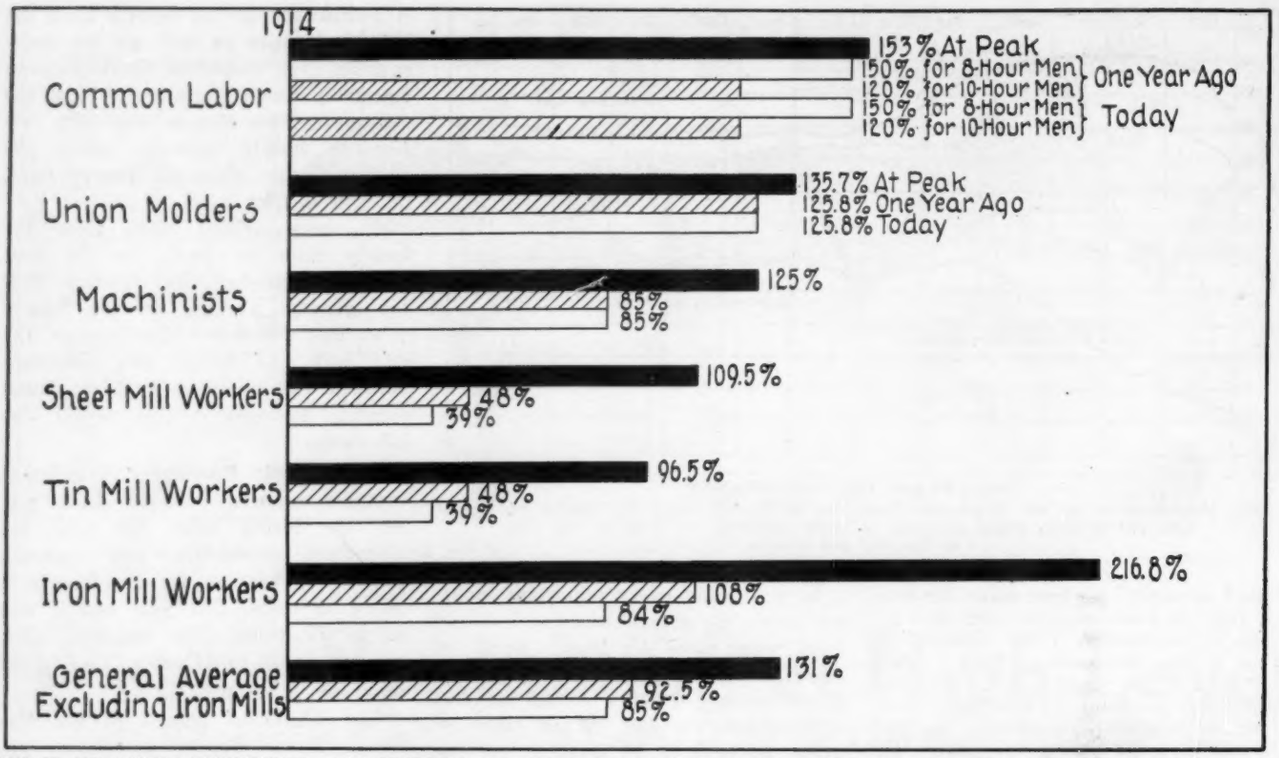
The Detroit Employers' association compiles reports from 40 cities, giving the hiring rates per hour for all-around machinists, and common labor. The average for the former is 60 to 68 cents. One year ago it was 62 to 72 cents. For common labor the rate is 39 to 44 cents. This is the same as 12 months prior.

The Cleveland branch of the National Metal Trades association reports average hiring rates for 25 separate classifications of machine shop workers, in the Cleveland district, from the toolmakers to common labor. The rates now are practically the same as 12 months ago.

These and similar reports from various representative cities bear out the assertion of the leaders of the industry that wages were not changed much during 1924. They expect rates will not go lower but more probably will be higher as production is increased.

Labor supply and demand were about balanced during the year. New hands, however, are not learning the trades in sufficient numbers to meet prospective needs. More effort is being made now than ever before toward training and educating workers. It is recognized wages must be sufficiently attractive to overcome the deficiency. Labor relations in the shops represented by the National Metal Trades association generally are satisfactory. The year 1924, like 1923, was singularly free from labor disputes; the trades have not had any serious clash since the strike in Cincinnati about four years ago.

Wages based on average selling prices for bar iron, sheets and tin plate dropped in 1924, in accordance with those prices. The general average at this time in bar mills represented by the Western Bar Iron Manufacturers association is 52 per cent over 1914, whereas a year ago it was 108 per cent over the prewar year. At the peak in 1920, the average went as



WAGE ADVANCES EXPRESSED IN PERCENTAGES OVER 1914 WHEN WAGES WERE AT THE PEAK IN 1920, A YEAR AGO, AND AS THEY ARE TODAY

Comparison of Wages in Machine Shops

	Average hiring rate, Feb., 1915	Average hiring rate at peak, 1920	Average hiring rate Jan. 1, 1925
Toolmakers	$0.40	$0.79	$0.72
Machinists	0.35	0.72	0.60
Lathe hands, under 24-inch	0.32½	0.65	0.55
Lathe hands, over 24-inch	0.37½	0.61	0.60
Planer hands, under 36-inch	0.30	0.72	0.57½
Planer hands, larger	0.35	0.70½	0.65
Grinders, rough	0.25	0.50	0.45
Scrapers	0.30	0.69	0.55
Floor hands	0.35	0.65	0.58
Bench hands	0.30	0.62	0.50
Drill press, ordinary	0.25	0.54	0.48
Drill press, radial	0.30	0.59	0.53
Boring mill	0.37½	0.72	0.60
Screw machine, hand	0.25	0.55½	0.50
Screw machine, automatic	0.30	0.65	0.60
Turret lathe	0.32½	0.65	0.50
Milling machine, hand	0.25	0.56	0.48
Milling, plain	0.27½	0.63	0.55
Milling, universal	0.30	0.58	0.60
Blacksmiths, forge men	0.30	0.70	0.64
Blacksmiths, hammermen	0.30	0.71	0.64
Pattermakers, wood	0.35	0.92	0.80
Helpers	0.25	0.54	0.46
Polishers	0.30	0.60	0.60
General labor	0.20	0.45	0.44

The foregoing averages while taken from the statistics in the Cleveland district are fairly representative of the averages in the largest districts of the country represented in the National Metal Trades association. The comparison is given to indicate the changes in wages applied to the more important classifications. In the majority of all reports, the minimum or maximum rates paid do not vary over 10 per cent from the above averages in Cleveland.

high as 216.8 per cent over 1914.

Puddlers today are paid $12.13 per ton of iron worked. A year ago the amount was $13.13. The average for the year 1914 was $5.60. The highest ever paid was $18.76 in the September-October period of 1920.

Bar iron prices which determine the bar mill wages have been dropping steadily for more than a year. An effort was made by the Amalgamated Association of Iron, Steel and Tin Workers to overcome the effect of this by demanding a step-up in base rates, from which actual wages are figured. Subsequently in conference with employers in June for negotiating a new agreement for 1924-1925, the demand was withdrawn. The amalgamated also waived a demand for raising the base rates for sheet and tin mill workers. The present bases continue in force six more months, and only fluctuations in the price of the products can affect the wages.

Sheet and tin mill workers' rates today average 39 per cent over 1914. A year ago they were 48 per cent. In 1920 they were up 109.5 per cent for sheet mill workers, and 96.5 per cent for tin mill employes. The latter were placed on the same wage basis as the former in 1923 and this has worked out their advantage.

The United States Steel Corp's rates for common labor which apply to several hundred thousand workers in the iron and steel industry have not been changed in the last 16 months. They are the same today as when the corporation announced its plan for

Wage Rates in General Manufacturing

Dec. 20, 1924

	All around machinists hiring rate per hour, cents	Common labor per hour, cents
Akron	75-85	35 -45
Albany	60-72	42 -50
Battle Creek	55-65	37½-42
Boston	65-70	45
Bridgeport	63	40 -45
Buffalo	65-70	40 -45
Canton	62-72	40 -45
Chicago	70-80	40 -55
Cincinnati	64-75	38 -46
Cleveland	60-70	40 -45
Columbus	55-65	40
Dayton	60-65	35 -40
Detroit	70-80	45 -50
Erie	55-75	40 -45
Flint	40-45	65 -80
Grand Rapids	50-60	40 -45
Hartford	58-65	39½
Indianapolis	50-75	30 -40
Jackson	60-70	35 -47½
Lansing	65-80	38 -40
Louisville	65-75	33
Memphis	80-85	30 -32
Milwaukee	60-70	37½-40
Moline	60-70	30 -40
Muskegon	58	40
Nashville	45	25
New York	65	45
Newark	60-65	40 -50
Philadelphia	60-65	35 -40
Pittsburgh	60-70	40 -50
Racine	50-65	40 -45
Rochester	65-75	50
Saginaw	60-72½	40 -45
South Bend	65	45
Springfield	60½	50
St. Louis	60-75	35 -40
Toledo	60-75	40 -50
Toronto	50-60	35 -40
Wilmington	60-70	30 -40
Worcester	55-70	40 -50

Figures compiled by Employers' Association of Detroit.

Recent Trends of Hourly Wage Rates in National Metal Trades

	New England	New York, New Jersey Pennsylvania	Ohio, Indiana	Michigan	Illinois, Wisconsin, Missouri	General average for all
June, 1923..	51.9	53.6	53.9	51.4	53.0	52.7
July	50.0	53.7	53.0	52.1	53.7	52.5
Aug.	50.1	56.6	55.5	53.7	53.8	53.9
Sept.	51.0	55.6	55.9	51.4	54.5	53.7
Oct.	52.4	57.7	54.6	53.2	54.6	54.5
Nov.	53.0	58.0	56.9	53.1	54.1	55.0
Dec.	52.0	58.7	54.5	54.3	54.0	54.7
Jan., 1924..	51.4	58.5	55.4	52.3	55.2	54.6
Feb.	51.6	58.4	55.0	53.0	55.4	54.7
March	51.8	58.3	55.2	53.0	55.6	54.8
April	53.0	59.3	55.7	53.0	56.4	55.5
May	52.7	59.1	56.3	53.0	56.3	55.5
June	52.8	59.0	56.0	53.4	56.7	55.6
July	52.2	58.3	57.0	54.7	56.6	55.8
August	52.1	59.5	57.0	54.4	56.7	56.0
Sept.	52.6	58.1	56.0	54.4	57.0	55.6
Oct.	52.6	58.2	56.5	54.5	56.7	55.7

The figures represent average hourly rates paid by leading employers in the National Metal Trades association, under the classifications of machine shops, foundries, pattern shops and common labor.

abolishing the 12-hour day, and for making the necessary revision in wages, in August 1923. A comparison of rates show how close those of the present are to the peak of 1920. In that year the hourly rate was 153 per cent over 1915. The wage of workers now on 8-hour shifts is 150 per cent above 1915 while that for the 10-hour workers is 120 per cent higher than 10 years ago. The men on the shorter shift receive 50 cents an hour, while the latter are paid 44 cents.

The average wage per month for employes in the iron and steel industry in October was $128.34. This represents the wage for 252,901 employes in 209 establishments, according to figures compiled by the department of labor.

The average for the year 1923 was $123.01, and for 1922 $98.78. The highest average was in 1920, with $151.06.

The amount paid in October represented an advance of $19.22 per month over the lowest point in 1924, the July wage having dropped to $109.12. The largest monthly average was in March, $137.73.

The first definite step toward an advance in rates effecting the iron and steel industry was taken Dec. 16, when independent coke producers in the Connellsville district increased wages 50 per cent, which was from $5 to $7.50 per day for the highest paid workers. The latter figure was in effect from Sept. 1, 1920 to May 16, 1921, and from Aug. 23, 1922 to June, 1924. The H. C. Frick Coke Co. did not reduce from the high level last June.

Employment in the basic manufacturing industries declined gradually during the first seven months of 1924. The index figure for each month was below the general average for 1923. Having reached the low point for the year in July, employment continued thus through August. The turn began in September, and employment since has been steadily increasing.

The decline in employment in the iron and steel industry did not really begin until May. In the first four months of the year the index hovered near the 1923 average. The improvement started in September, the same as in general manufacturing.

The indices of employment when placed alongside of those for production afford interesting comparisons. It is true that labor efficiency droops as labor demand increases, with more opportunities for work. But the indices show that steel ingot production dropped much faster than employment in the iron and steel industry during 1924, and hence per capita production, or "labor efficiency" as it sometimes is called, showed considerable loss. This undoubtedly was due to the tendency to hold labor forces, even while production was declining.

The production index generally is considerably above that for employment. In June and July, however, the exception occurred in the iron and steel industry, and the production index fell below employment. The index representing production in basic manufacturing industries, however, held up above that for employment. In both instances, 1919 is used to represent the base, 100, in the figures as compiled by the federal reserve bank. An accompanying chart illustrates the employment and production trends during the last five years.

Employment Increasing

A strong upward trend in employment is reported by members of the National Metal Trades association.

In the New England district the increase was steady during the six months as follows: June, 37,290; July, 36,707; August, 61,108; September, 62,734; October, 63,769; and November, 65,260.

In the New York, New Jersey, Philadelphia district employment dropped from 100,951 in June to 93,555 in July; advanced to 105,556 in August, further to 108,012 in September, and receded to 57,104 in October. In November the number advanced to 104,072.

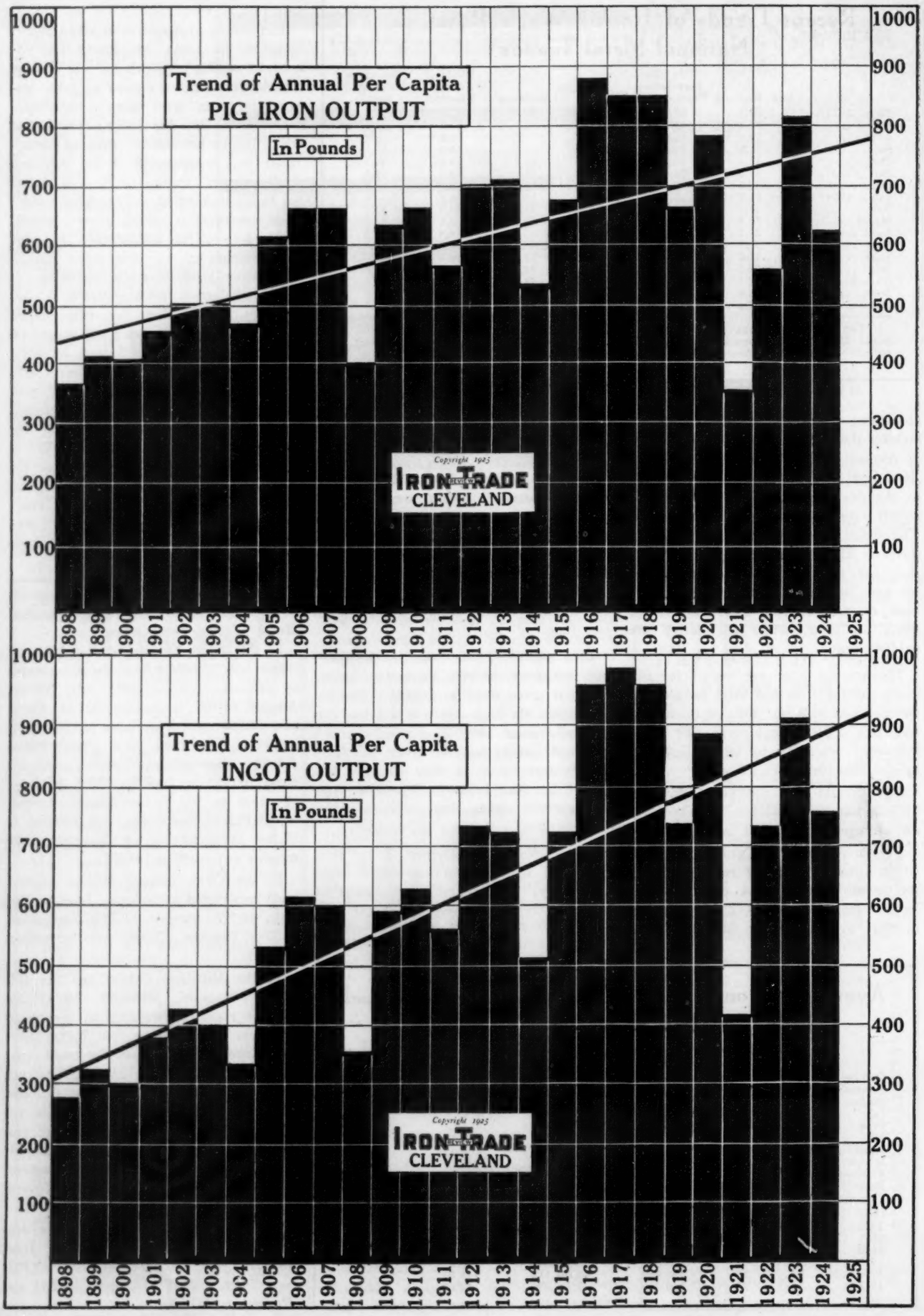
In the Ohio, Indiana district employment progressed as follows: June, 67,016; July, 66,378; August, 67,700; September, 71,734; October, 72,309, and November, 72,063.

In the Michigan district and the Illinois, Wisconsin, Missouri district the number reported employed in November was less than in June, but higher than in October. In Michigan the trend was: June, 226,761; July, 223,403; August, 222,222; September, 226,486; October, 214,370, and November, 215,713. In the Illinois, Wisconsin, Missouri district employment was as follows: June, 28,159; July, 22,404; August, 23,716; September, 23,913; October, 24,291, and November, 24,591.

For all districts collectively the employment barometer is as follows: June, 460,177; July, 442,447; August, 480,302; September, 492,879; October, 431,843 and November, 481,699.

Average Monthly Wages in Iron and Steel Industry, and Number of Employes

	Number of establishments	Number of employes	Payroll for half month	Average wage per month	Average wage year previous
October	209	252,901	$16,438,817	$128.34	$129.98
September	213	241,031	14,999,921	124.42	126.76
August	198	217,617	13,649,206	127.92	127.92
July	224	239,907	13,091,599	109.12	119.38
June	229	251,976	14,508,757	115.12	128.71
May	217	253,980	16,791,392	132.30	135.91
April	209	178,911	18,188,376	130.42	118.78
March	216	283,879	19,549,452	137.73	123.52
February	170	276,986	17,893,043	129.19	122.24
January, 1924	209	258,736	16,559,659	128.00	120.59
Averages:					
1923	183	229,594	14,125,068	123.01	.....
1922	118	147,882	7,378,535	98.78	.....
1921	114	117,223	5,869,438	100.12	.....
1920	105	172,318	13,015,883	151.06	.....
1919	105	154,244	9,989,098	128.22	.....
1918	97	180,859	10,734,114	118.74	.....
1917	97	180,088	8,327,492	92.49	.....


Trend of Annual Per Capita
PIG IRON OUTPUT
In Pounds
Copyright 1925
IRON TRADE
CLEVELAND
Trend of Annual Per Capita
INGOT OUTPUT
In Pounds
Copyright 1925
IRON TRADE
CLEVELAND
1000
900
800
700
600
500
400
300
200
100
1898
1899
1900
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1902
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Per Capita Production Declines

Pig Iron Per Capita Less Than It Was in 1913

Record for Ingots and Castings Above Prewar Level

A STUDY of the record of per capita outputs of pig iron and steel ingots and castings for 1924 reveals a number of important facts. It shows:

First: That the number of pounds of both iron and steel turned out for each inhabitant of the country was less than in 1923.

Second: That the totals for the year were less than the normal expectation, computed from the annual records over a period of more than 25 years.

All Steel Production Per Capita 1878-1924

Year	Population in thousands	Steel ingots and castings output in gross tons thousands	Output per capita pounds
1924	112,000	37,773	755
1923	110,663	44,943	911
1922	109,248	35,603	730
1921	107,833	19,783	411
1920	106,418	42,132	887
1919	105,003	34,671	739
1918	103,587	44,462	961
1917	102,172	45,060	987
1916	100,757	42,773	950
1915	99,342	32,151	724
1914	97,927	23,513	509
1913	96,512	31,300	725
1912	95,097	31,251	736
1911	93,682	23,676	565
1910	92,174	26,094	634
1909	90,556	23,955	592
1908	88,939	14,023	353
1907	87,320	23,362	599
1906	85,702	23,398	611
1905	84,085	20,023	533
1904	82,467	13,859	335
1903	80,848	14,534	402
1902	79,231	14,947	422
1901	77,612	13,473	375
1900	75,995	10,188	300
1899	74,318	10,639	320
1898	72,947	8,932	274
1897	71,592	7,156	223
1896	70,254	5,281	168
1895	68,934	6,114	198
1894	67,632	4,412	146
1893	66,349	4,019	135
1892	65,086	4,927	169
1891	63,844	3,904	121
1890	62,948	4,277	152
1889	61,298	3,385	123
1888	59,974	2,899	108
1887	58,680	3,339	127
1886	57,404	2,562	99
1885	56,148	1,711	68
1884	54,911	1,550	63
1883	53,693	1,673	69
1882	52,495	1,736	74
1881	51,316	1,588	69
1880	50,156	1,247	55
1879	48,886	935	42
1878	47,598	732	34

Third: That the per capita output of pig iron in 1924 was smaller than the annual average for the five years from 1910 to 1914, while that for ingots was only 19 per cent above its prewar average.

From these facts it is possible to draw the conclusion that success attended the efforts of producers to keep outputs trimmed closely to the line of consumption in 1924. Clearly no important accumulation of iron and steel has taken place during the past 12 months. Moreover it is indicated that surplus stocks have been reduced. From which it follows that the industry is in a most favorable position for the period of improvement now beginning.

The estimated production of pig iron for 1924 in 31,082,451 gross tons. The estimated population of the United States is 112,000,000. From these totals it is found that the per capita production of iron was 622 pounds compared with 815 pounds in 1923. As shown on the graph on the opposite page a normal per capita production for the year would have been approximately 770 pounds. In 1923 the record climbed above normal. With the exception of 1921 and 1922 the output of iron for each inhabitant in 1924 was the lowest since 1914. It was actually lower than the per capita production of 717 pounds in 1913.

This fact, taken in the light of the vast increase in the use of such products as the automobile, seems to indicate that the past few months have seen an accumulation of needs for steel.

For steel ingots and castings the annual total is placed at 37,773,619 gross tons. The per capita production was 755 pounds against 911 pounds in 1923 and a theoretical normal for the year of about 875 pounds. The 1924 showing was the smallest for any year since 1915, with the exception of the depression periods of 1921 and 1922.

Both pig iron and steel ingots were produced in somewhat excessive quantities in 1923. The per capita output of pig iron went about 7 per cent above its normal line, while that of ingots was about 4 per cent above its normal in 1923. If pig iron production per capita went further above the normal line in 1923 than steel it suffered a greater decline in 1924. The drop last year was 19 per cent for iron against only 15 per cent for steel ingots and castings compared with normal.

The amazing increase in the production of steel per capital from 34 pounds annually in 1878 to the present normal of around 900 pounds, and particularly the increase in the last quarter of a century, is a measure of the gigantic stride of modern industrial progress. Scientific improvement in methods of production, the multiplication of inventions and the increase in the variety of products contributing to the present high standards of living, all mean greater consumption of steel per capita.

In recent years the depleted purchasing power of the farmer has caused an under-consumption of tools and implements, from that source. In 1925, agricultural buying promises to improve. Moreover railroad and automobile demand should be good. With stocks of steel at moderate or even low levels, and with every fundamental consideration pointing toward increased consumption, per capita outputs of both iron and steel probably will reach or surpass their normal levels in 1925.

Pig Iron Production Per Capita 1878-1924

Year	Population in thousands	Pig iron output in gross tons thousands	Output per capita pounds
1924	112,000	31,082	622
1923	110,663	40,277	815
1922	109,248	27,219	557
1921	107,833	16,688	345
1920	106,418	36,926	777
1919	105,003	31,015	661
1918	103,587	39,054	843
1917	102,172	38,621	846
1916	100,757	39,434	876
1915	99,342	29,916	677
1914	97,927	23,332	533
1913	96,512	30,966	717
1912	95,097	29,726	700
1911	93,682	23,649	564
1910	92,267	27,303	663
1909	90,556	25,795	638
1908	88,939	15,936	400
1907	87,320	25,781	661
1906	85,702	25,307	661
1905	84,085	22,992	612
1904	82,467	16,497	462
1903	80,848	18,009	500
1902	79,231	17,821	504
1901	77,612	15,878	458
1900	75,995	13,789	406
1899	74,318	13,620	409
1898	72,947	11,773	361
1897	71,592	9,652	302
1896	70,254	8,623	274
1895	68,934	9,446	306
1894	67,632	6,657	220
1893	66,349	7,124	239
1892	65,086	9,157	315
1891	63,844	8,279	289
1890	62,948	9,202	327
1889	61,298	7,603	277
1888	59,974	6,489	242
1887	58,680	6,417	244
1886	57,404	5,683	221
1885	56,148	4,044	161
1884	54,911	4,097	166
1883	53,693	4,595	191
1882	52,495	4,623	197
1881	51,316	4,144	188
1880	50,156	3,835	171
1879	48,886	2,741	125
1878	47,598	2,301	108

Business Elements on a Sound Basis as 1925 Begins

Economic Course of 1924 Is Marked by Numerous Major Constructive Developments

BY JOHN W. HILL

FOUR supremely significant developments marked the economic progress of 1924. They include, the sweeping advances of grain prices; the beginning of European recuperation; the start of a new cycle of business improvement; and the stimulation given business and investment sentiment by the foundering of the ship of political radicalism.

THESE developments, together with an easy credit condition almost unmatched in the financial history of the present century, have laid a deep foundation for business prosperity. The New Year opens with recovery well under way. Every fundamental consideration indicates that improvement will continue until a period of genuine good times is attained.

The duration of prosperous conditions will depend upon factors arising in the uncharted future. That they will be longer maintained than have been previous periods of recovery since the war, seems assured. The pillars supporting the structure of revival are sturdier, more numerous, and more promising of widely diffused and extended prosperity than any in recent years.

THE only immediate cause for apprehension is that the pace should grow too rapid. This might lead to over-enthusiasm with its concomitant of speculative excesses in trade. For the present, however, industry is holding its feet on solid ground On the stock market the election was followed by a historic burst of activity. But business has confined its manifestation of confidence to expanding operations in response to enlarged demand and to a gradual relaxation of the long-maintained policy of piecemeal buying, where justified by prices and probable needs.

Nineteen twenty-four began with Europe toppling upon the brink of chaos, and the American farmer in the depths of depression. Business sentiment was disturbed, during the early months, by the threat of overproduction and by the congressional probes.

THE year has closed with the Dawes plan in operation, with the farmer restored to his proper economic place, with overproduction corrected by deep industrial curtailment in the summer, and with the demogogues silenced. Moreover taxes are lower.

DURING 1924 the world weathered a most severe phase of postwar readjustment. The result has been a rebirth of business and investment confidence here and abroad. A period of rising activities is promised which some believe may compare in vigor and extent with the era of expansion following the recovery of 1897. Abroad await the delayed tasks of postwar rehabilitation and of creating living standards more in conformity with modern conceptions. In this country the farmer's rundown equipment must be replaced, and the stupendous consumptive requirements of 112,000,000 people enjoying the highest plane of living the world has ever seen must be provided. The year should bring a test of Americ a's plant capacity.

ECONOMIC conditions in the United States are being profoundly affected by changed affairs in Europe. Increased exports of grain and raw materials are enhancing the prosperity of producers of these commodities. This in turn is reflected in general business. Loans to Europe have reached an annual rate of over $1,000,000,000. That is absorbing idle credit. The results are that interest rates are slightly firmer and that gold has begun to flow out.

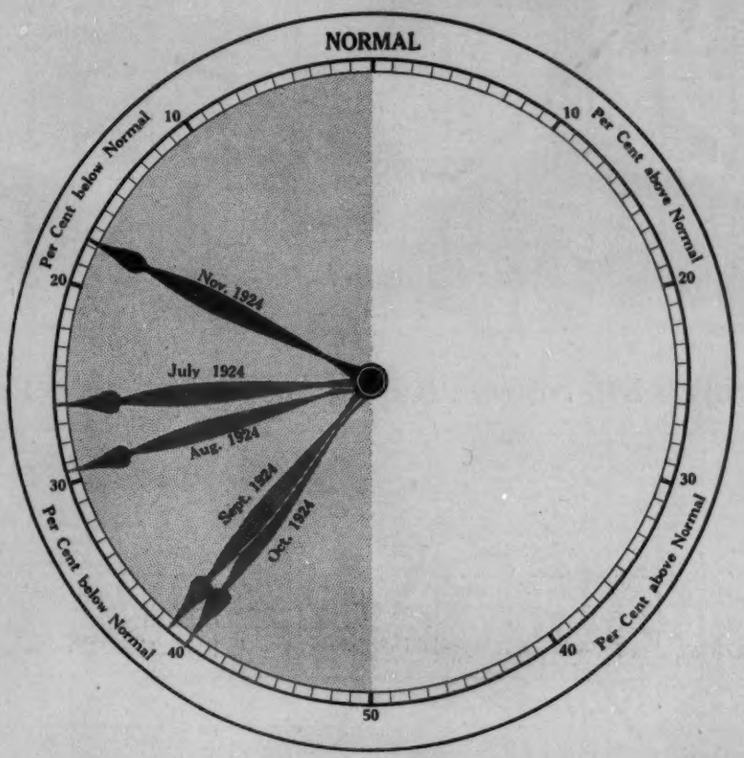
The coming year may bring increasing competition from Europe for domestic products. But American manufacturers held ther own in the world trade struggle before the war and they probably can now.

IN SUM, it may be said that a new cycle of improvement is under way; that it is increasing in velocity and promises to be maintained well into 1925 and that with Europe convalescing, the farmers more properous, and money slightly firmer, but still abundant and cheap, all the elements of prosperity are at hand. Although volumes are growing, the keen edge of competition is unlikely to become blunted. Profit margins are broadening but they do not promise to become sufficiently wide to justify recklessness. Salesmanship, efficiency, and economical production will remain at a premium even in the activity ahead.

The Business Trend

BLAST FURNACE BUSINESS DIAL

The Dial represents the Blast Furnace Index of Business devised by Col. L. P. Ayres of the Cleveland Trust Co. It is a barometer of general trade.



When 60 per cent of all the country's furnaces are in blast business conditions are normal. The index is now rising toward the normal point.

HIGH POINTS OF THE SITUATION

INDUSTRY passed through three distinct phases in 1924. There was a brief show of activity early in the year, a summer slump, and subsequent recovery. The Business Trend charts which follow, portray the record of the past 12 months. They also indicate the trend for 1925. That trend is upward. Among the outstanding facts of 1924 directly or indirectly reflected by the diagrams are the following:

EUROPE—Inauguration of the Dawes plan has helped Europe to get a start toward recuperation. Exchange rates are higher and vast loans abroad are being made by this country.

PRODUCTION—Outputs of basic industries dropped 22 per cent to the midsummer low. Pig iron declined 48 per cent. Basic outputs since have gained 16 per cent and iron 45 per cent.

LABOR—Factory employment declined to 87 per cent of 1919 average during the year. Demand for labor now is increasing. This fact, with higher living costs, may bring wage advances.

BUILDING—Construction totals in 1924 exceeded the gigantic peaks of 1923. Activities promise to remain large with more industrial and somewhat less residential building.

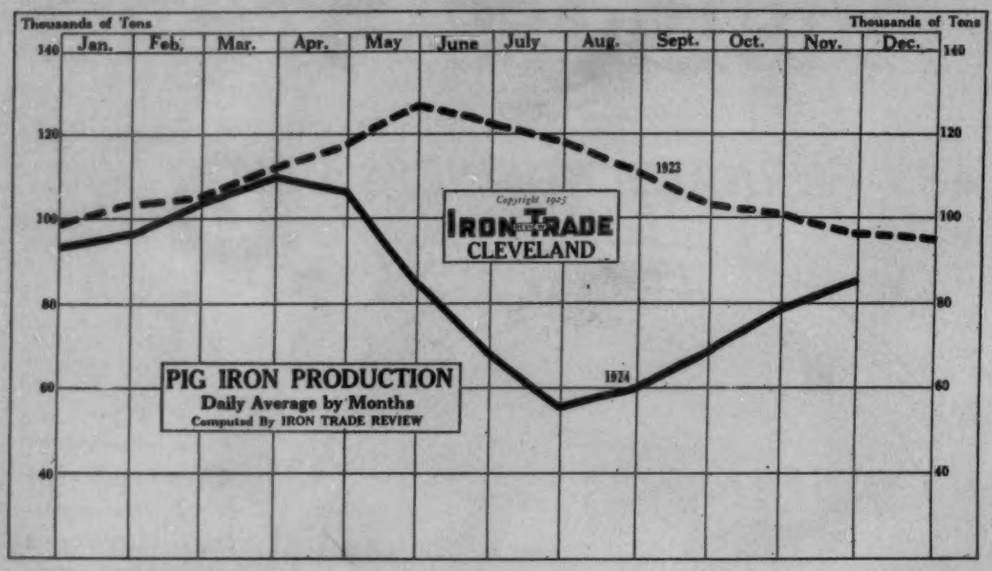
AGRICULTURE—The year closed the gap between rural and industrial prices and restored the farmer's buying power. His economic position is now the best since 1920.

CREDIT—Ample and cheap credit has helped industry move forward. Money rates are now tending slightly higher due to increasing demand for foreign and domestic loans.

RAILROADS—New traffic records for all time were made by the railroads last fall. There has been no car shortage. The roads are preparing for great transportation needs in 1925.

PRICES—Wholesale commodity prices dropped steadily until the summer months. The subsequent rebound has been 10 per cent. Sweeping advances for grains were a big factor in rise.

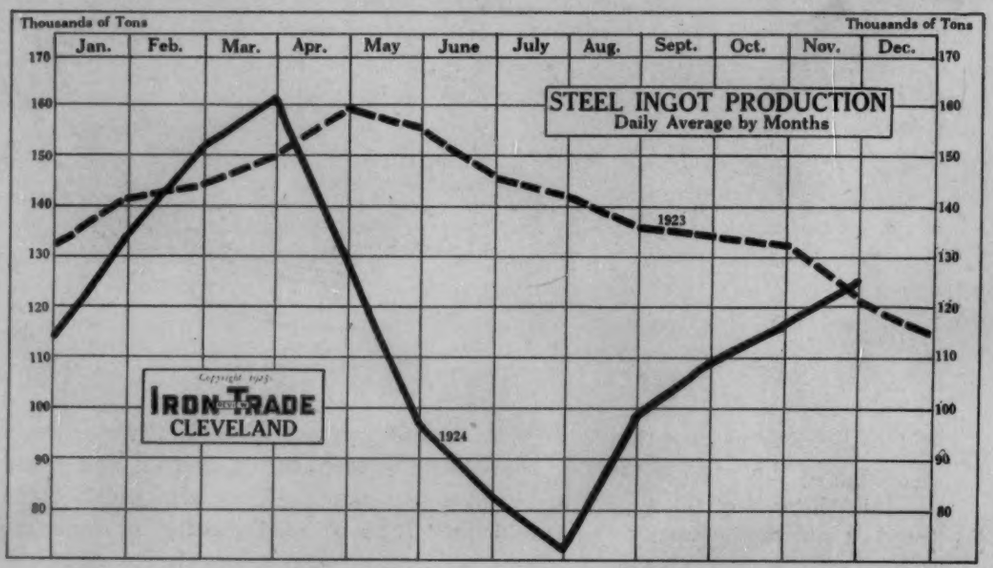
Pig Iron Production Measures General Recovery Since Summer



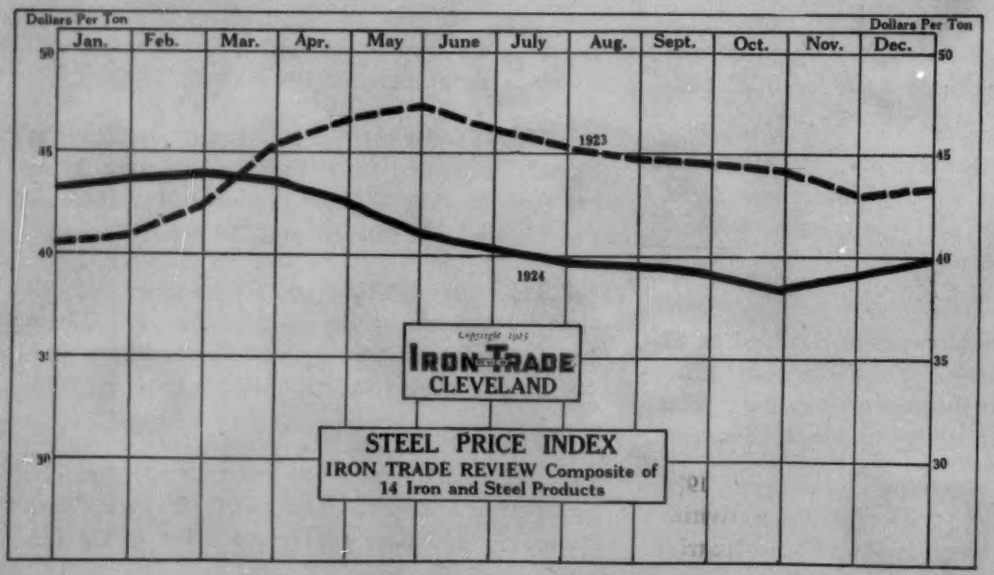
THE production of pig iron in 1924 fell back from the great peak of 40,277,027 tons reached in 1923. The total for the year is estimated at 31,082,-451 tons, or 22 per cent less than the record for the preceding 12 months. The highest point for production in 1924 came with the daily average of 111,800 tons in March. From that level there was a drop of 48 per cent to a daily average of 57,600 tons in July. August brought improvement and by November output had reached a daily average of 83,775 tons.

Steel Ingot Production Shows Rapid Forward Stride From Low Point

TWO new records were established in steel ingots in 1924. One was in the rise of daily average output in March to 161,075 tons, the highest level for all time. The other record was made in the unequaled 55 per cent decline from the March peak to the low point in July. This compared with a decline of 50 per cent at the worst of the 1921 slump. August brought a turn and from July to November ingot output had gained 72 per cent. Estimated output for the year is 36,593,619 tons against 43,485,665 tons in 1923.



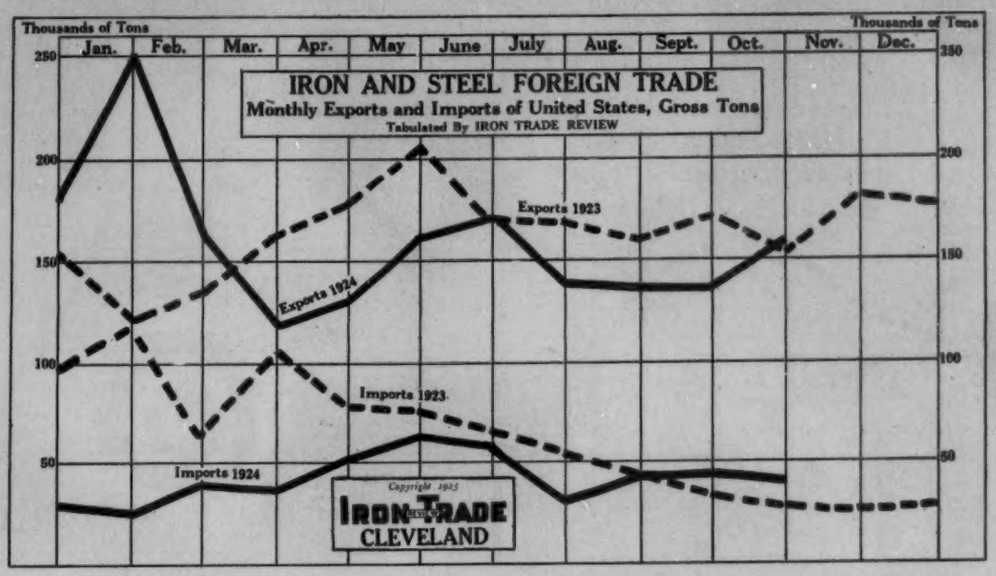
Iron and Steel Price Index Finally Responds to Trade Improvement



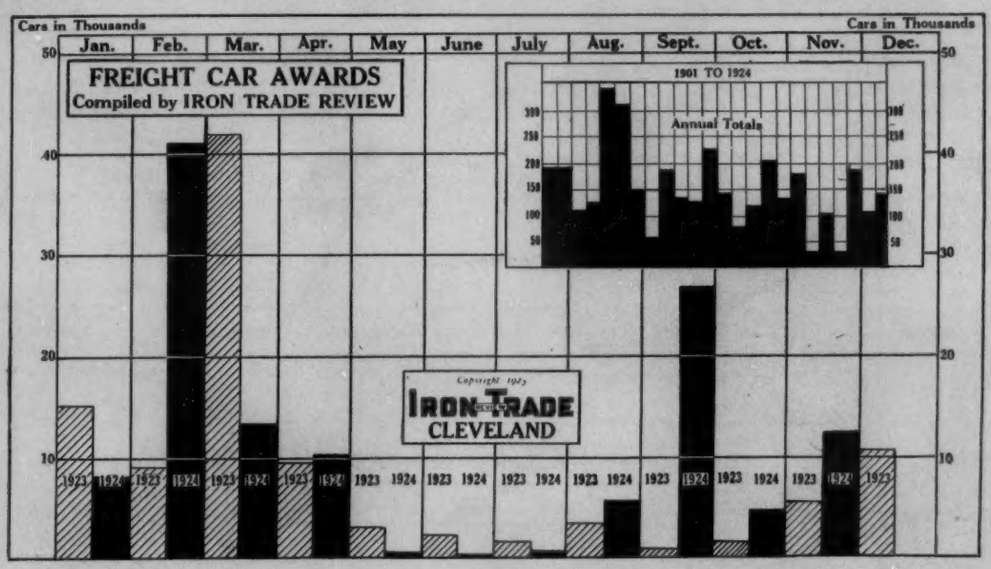
IRON and steel prices were dragging at unprofitable levels during much of 1924. The tremendous spurt of production early in the year followed by a sharp curtailment of demand had a depressing effect upon quotations. IRON TRADE REVIEW'S *composite market index of 14 iron and steel prices was at its highest 1924 level in February. It then stood 65 per cent above the 1913 average. From this point the decline continued until November, although production increased in August.*

1924 Iron and Steel Foreign Trade Less in Volume Than in 1923

IRON and steel exports for the first 10 months of 1924 averaged 129,200 tons monthly. This compares with a monthly average of 166,000 tons in the same period of 1923 and with 172,000 tons in the same period of 1922. Imports also have been smaller than they were in 1923. The monthly average of imports from Jan. 1 to Nov. 1 was 37,600 tons against 68,000 tons in the same period of 1923 and 47,500 tons in the corresponding period of 1922. The monthly average of exports in 1924 was below 1913.



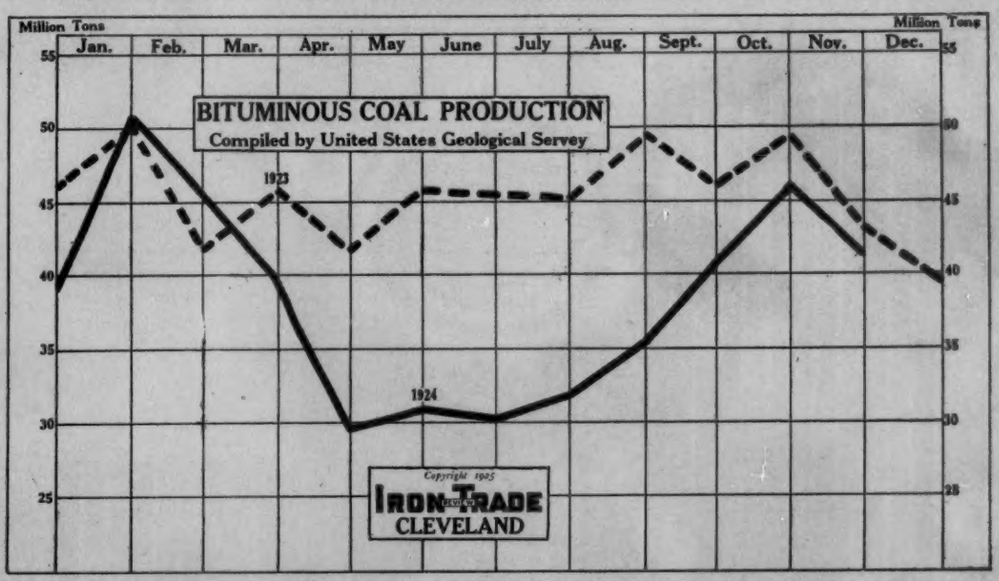
Railroads in 1924 Bought More Freight Cars Than in the Previous Year



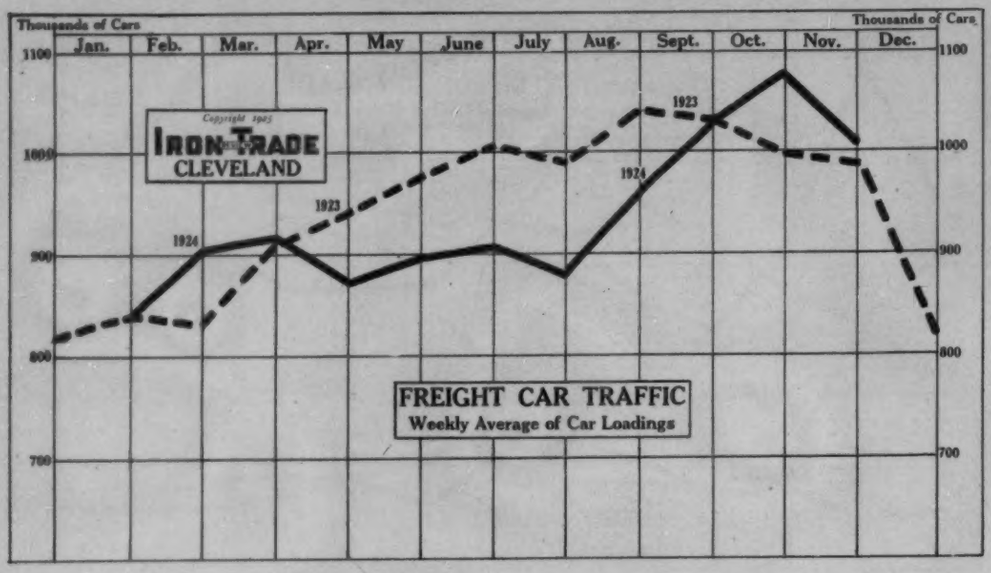
PURCHASES of freight cars by the country's railroads in 1924 were the largest since 1922. With that exception the 1924 total surpassed any other year back to 1918. During 11 months from January to November the aggregate of awards was 125,000 cars, as computed by IRON TRADE REVIEW. *This compares with 91,886 cars in the same period of 1923 and with 103,000 cars for the entire year of 1923. In 1922 the awards numbered 157,210 cars. Tremendous traffic records have spurred railroad purchases of cars.*

Bituminous Coal Production Lagged Behind During Most of 1924

THE strike threat which overhung the bituminous coal industry early in 1924 stimulated production to great heights. Large stocks were piled. The settlement of the wage difficulties in March and the general decline in industry came at about the same time. The demand for coal fell off and production shrunk drastically. In April output was only 59 per cent of what it had been in January. Total output for the year is estimated at 470,000,000 tons against 545,000,000 tons in 1923. Output has been up since August.



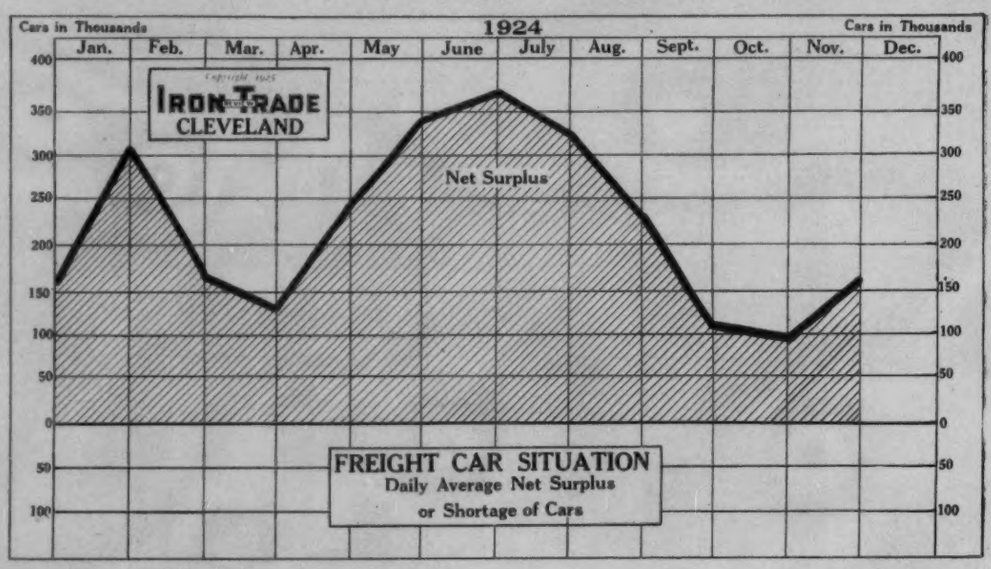
Freight Movements Attained Unprecedented Heights in October



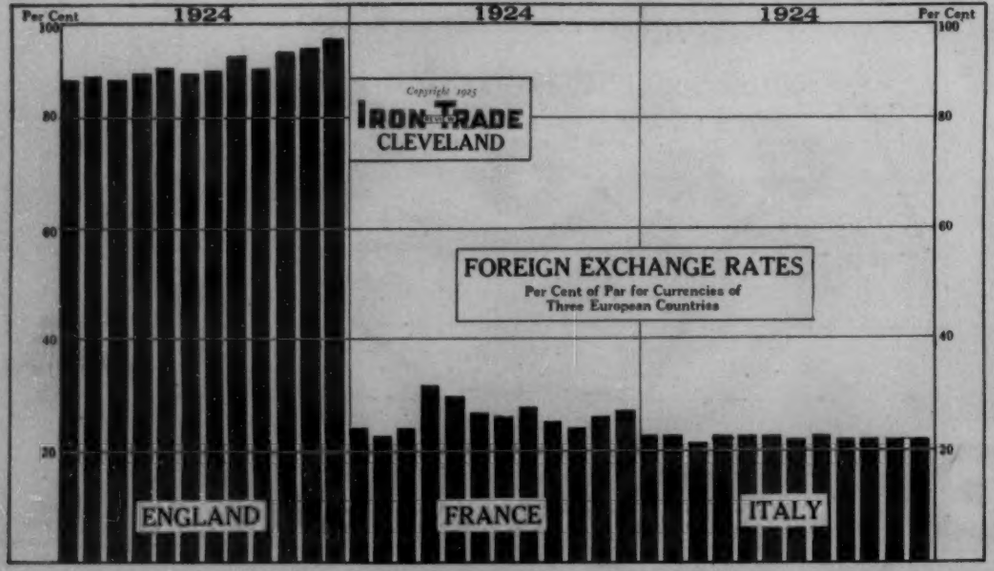
OWING to the sharp depression of production during the summer months the aggregate of car loadings in 1924 was slightly behind that of 1923. However, loadings for the year of all commodities, except coal, coke and ore, established new high marks in 1924. Beginning with August, traffic started to gain and in September it overtook and passed the 1923 peaks. During the fall freight movement, eight new high records were made by the roads. The peak of weekly traffic movement came in October.

Year of Gigantic Traffic Peaks Has Been Devoid of Car Shortage

THIS diagram reveals an eloquent story of railroad efficiency in 1924. Although freight movements during the Autumn reached unprecedented heights, at no time was a shortage of cars threatened. In 1920, car loadings of 1,000,000 cars a week were accompanied by shortages of as high as 147,000 cars. Last year with fewer cars and practically no more locomotives the roads moved 10 per cent more freight than they did five years ago and yet did not touch their maximum capacity.



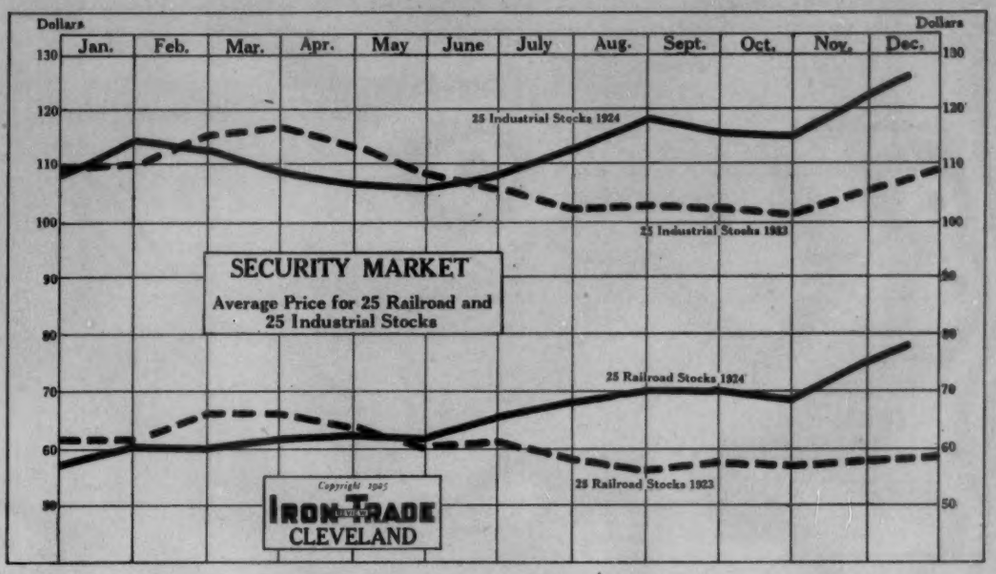
Europe's Improvement Measured in Firmer Foreign Exchange Rates



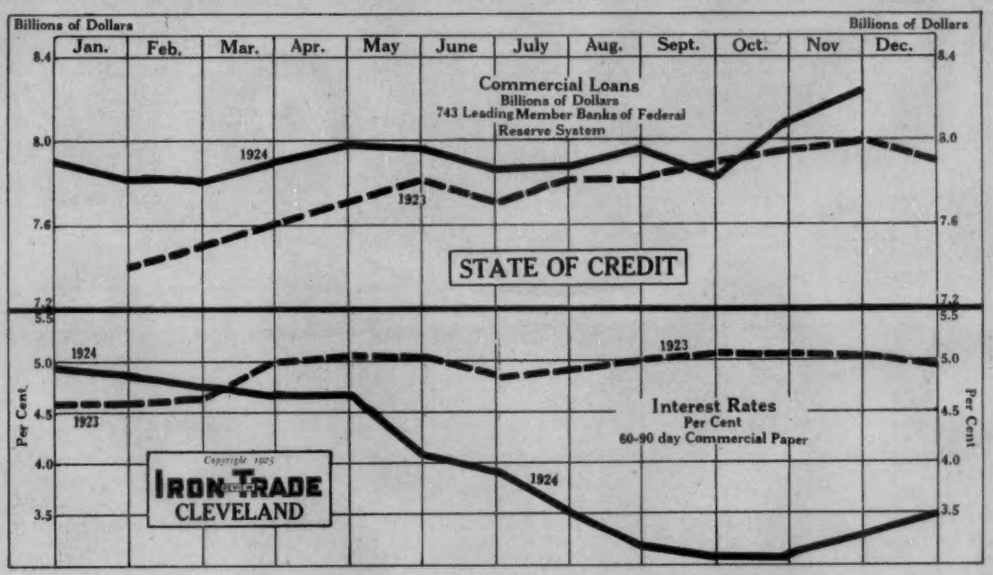
THE inauguration of the Dawes plan has helped to start the processes of economic recuperation in Europe. The result is reflected in the firmer exchange rates for some European currencies, three of which are shown in the diagram.. The striking advance of British sterling was also aided by the victory of the conservative party in the October election. The United States is contributing materially to the financial rehabilitation abroad. Germany and France each borrowed $100,000,000 here last fall.

Election Results in November Brought Historic Stock Market Activity

THE stock market had two bursts of activity in 1924. One was in the summer, culminating in August. The other started the day after the national election on Nov. 4. The latter movement was historic, both in the number of transactions and in the rise of prices. In November sales were the largest since April, 1901. Fully 753 stock issues were dealt in and over 300 of them made new highs for the year. Twenty-five industrial shares in November touched the highest peak since the 1919 boom.



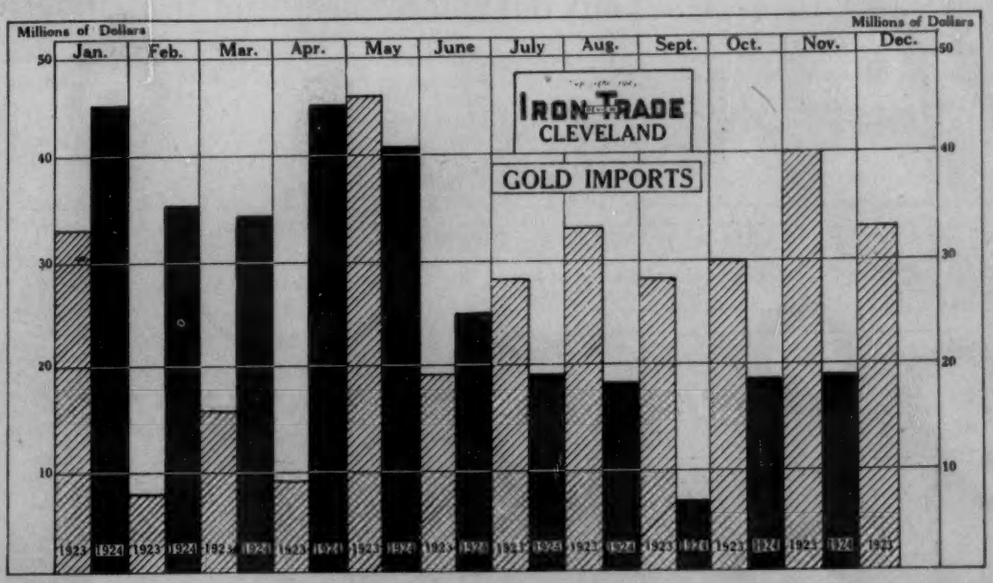
Money Remains Easy Despite Advancing Curve of Commercial Loans



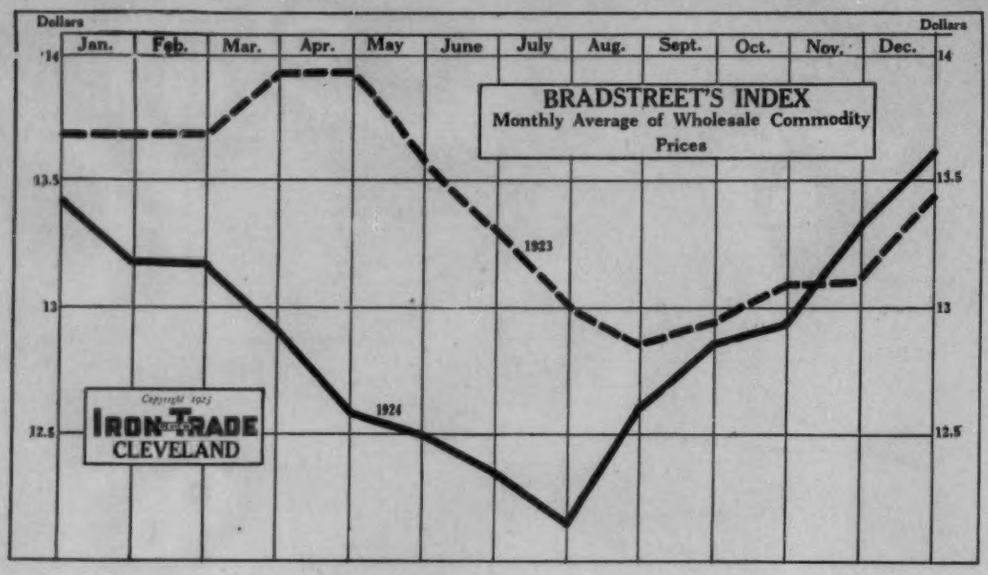
THE year 1924 has been characterized by a great abundance of banking credit and extraordinarily cheap money rates. Both resulted from slack business and from huge gold imports. The credit slack is now being slowly absorbed by large foreign loans. Commercial loans are increasing also and they are now at the highest point since the middle of 1921. Not in a generation have autumn money rates been so low as this year. At least slightly firmer interest rates are in prospect for 1925.

Rate of Gold Imports Declined Sharply in Last Half of the Year

SINCE 1914 huge imports of gold have caused the supply of the metal in the United States to mount to $4,555,000,000. This is over one-half the world's total monetary gold stocks. The yellow flood has come largely from Europe in the payment of debts and for purchases. The presence of the vast reserves of gold has swollen idle banking resources and created the basis for gold inflation. However, with Europe's improving economic position gold imports are smaller and gold exports are starting.



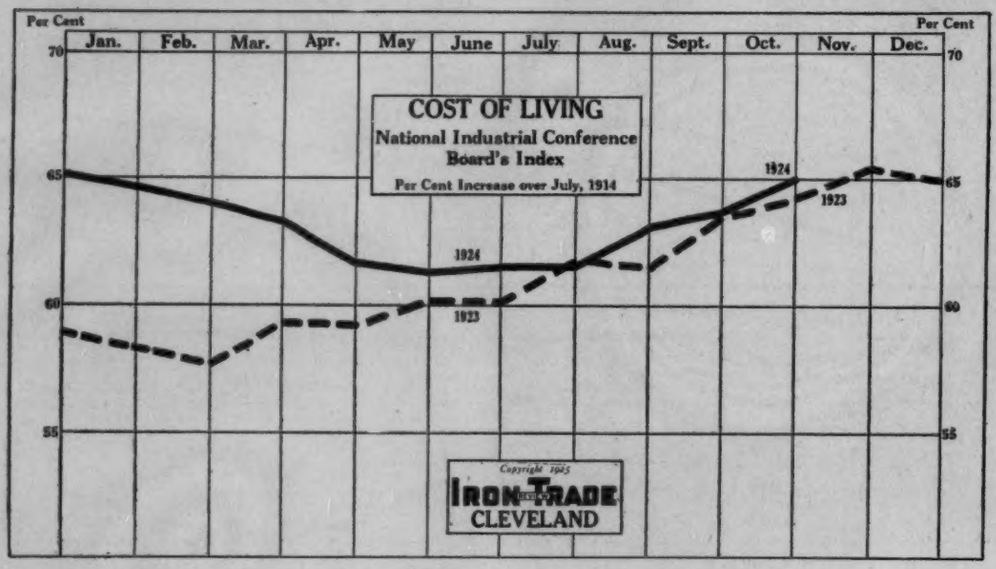
Bradstreet's Index of Wholesale Prices Makes Sharp Rise in 1924



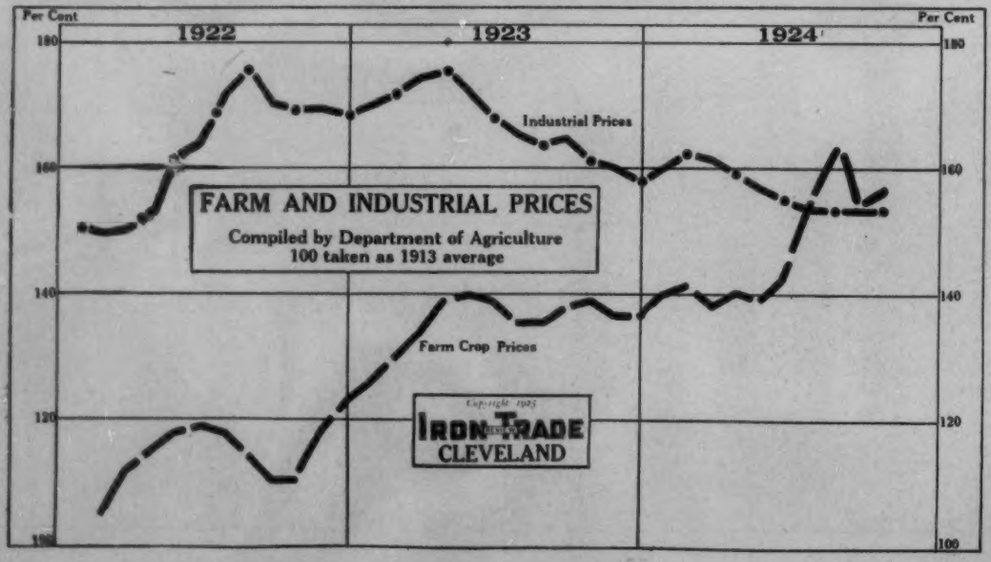
COMMODITY prices fluctuated more sharply during 1924 than during the previous year. Heaviness in values appeared early in the year. Measured by Bradstreet's index the bottom level was reached on July 1. At that point prices were 32 per cent above the 1913 average. From this date the index started to advance. First impetus for the rise came from the rapidly climbing values of farm goods. On Dec. 1 the index stood 46 per cent above 1913 against 52 per cent one year before.

Rising Living Costs One Factor Confronting Business in 1925

THE advance of wholesale prices for foods, clothing and many other articles of consumption is having the logical result of increasing living costs. The index compiled by the National Industrial Conference board in November stood at 65.2 per cent above the level of July, 1914. This was the highest point touched in 1924. At the low level in May the index was 61.4 per cent higher than in 1914. The index is now 19 per cent below the 1920 peak. Advancing living costs may tend to restrict consumption.



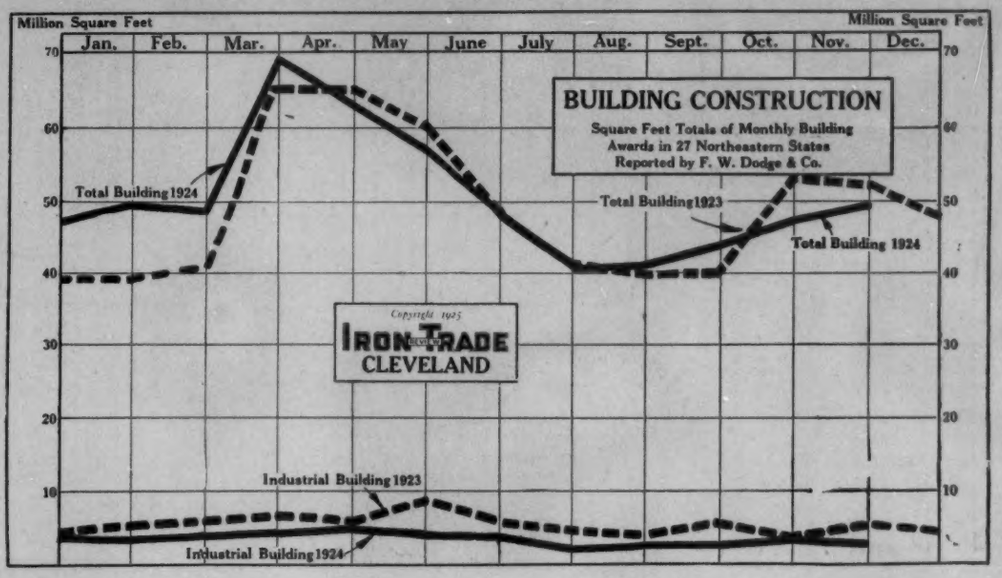
1924 Closed the Gap Between Farm and Industrial Product Prices



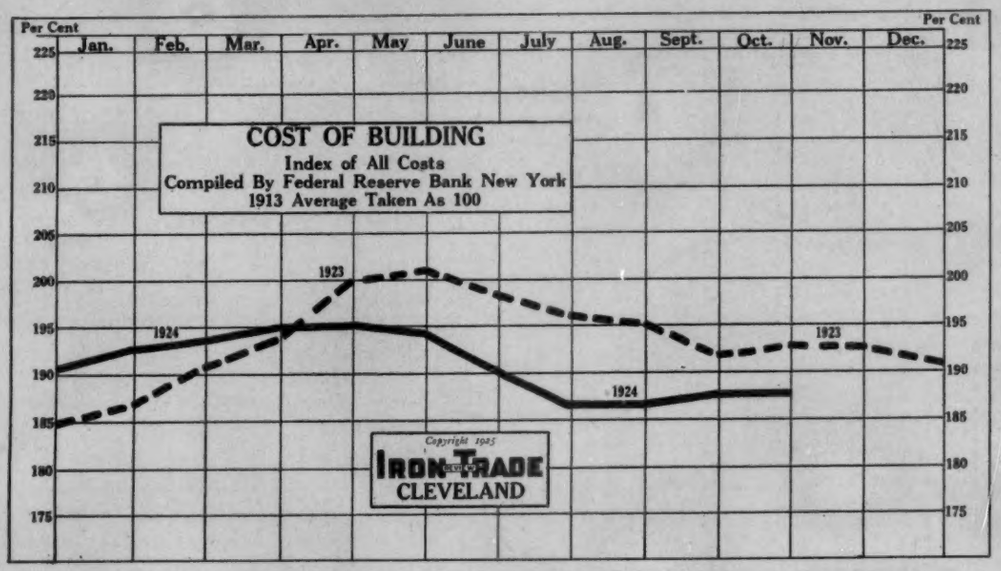
ONE of the most important economic achievements of 1924 occurred when the gap between the prices of farm products and of industrial goods was closed. This discrepancy has been the sorest spot in the domestic situation since 1921. It depleted the farmer's purchasing power and hampered general activity. From a common base of 100 in 1913 farm crop prices stood at an index of 109 in 1921, while industrial goods were at 161. From that point crop values gradually advanced and other prices fell.

Great 1923 Building Construction Was Matched by 1924 Activities

THE volume of construction in the United States in 1924 exceeded the gigantic total for 1923. For the 11 months from January to November awards in 27 Northeastern states as reported by F. W. Dodge amounted to 558,424,000 square feet. This compared with 549,659,000 in the same period of 1923. Residential construction constituted 60 per cent of the total and increased slightly over the 1923 record. Recently, residential building has been less active, indicating that housing shortages are less acute.


Million Square Feet
Million Square Feet
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
70 60 50 40 30 20 10
BUILDING CONSTRUCTION
Square Feet Totals of Monthly Building Awards in 27 Northeastern States Reported by F. W. Dodge & Co.
Total Building 1924
Total Building 1923
Total Building 1924
Industrial Building 1923
Industrial Building 1924
Copyright 1925
IRON TRADE
CLEVELAND

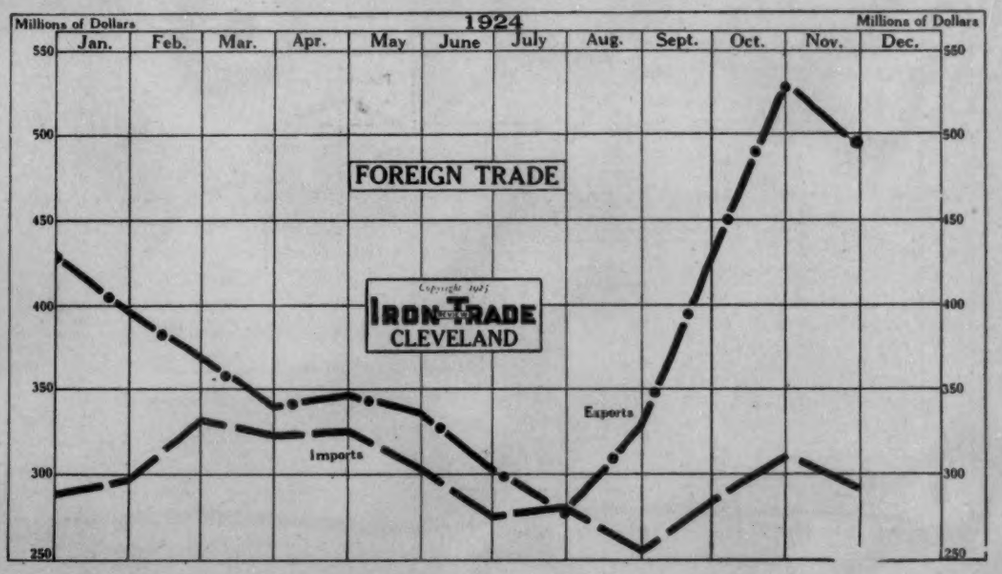
Cost of Building Index Shows Slight Advance Over Summer Levels



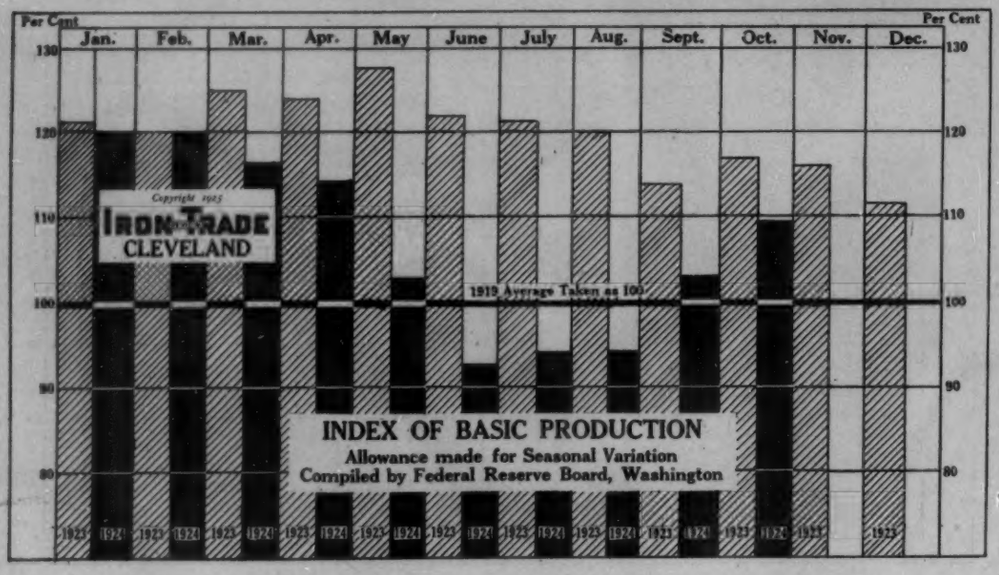
IN THE closing months' of 1924 the cost of construction, as computed by the federal reserve bank of New York, was 88 per cent above the 1913 level. During the summer the index dropped to 87 per cent above 1913, which was the lowest point touched since the close of 1922. It was 13 per cent under the 1923 peak and 25 per cent below the top in 1920. The slight advance in the fall was due to higher material prices, which stand at 71 per cent above 1913. Wages are 114 per cent over prewar. They are a shade under the peak for all time.

Expanding Export Markets Have Featured Revival of Recent Months

DURING 11 months of 1924 American exports totaled $4,145,726,294. This was a gain of 10 per cent over the aggregate of $3,740,827,561 in the corresponding period of 1923. Imports for the period amounted to $3,276,672,967, a loss of 6 per cent from the total for 11 months of 1923. From Jan. 1 to Dec. 1 the excess of exports over imports was $869,053,327 compared with an excess of $237,066,364 in 1923. The export total was augmented by the enormous volumes of wheat and flour, cotton etc., purchased by Europe.



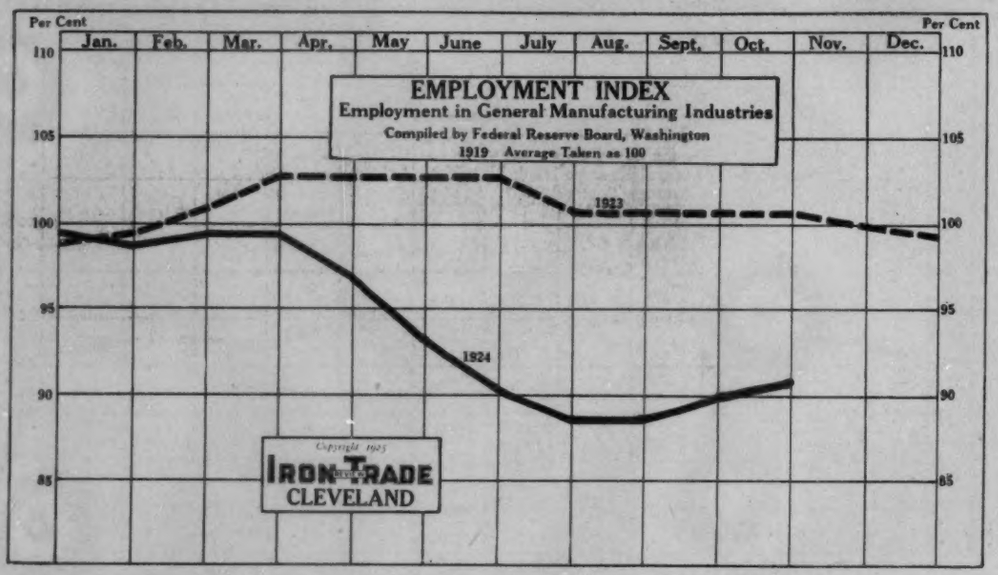
Year Brought Extraordinary Decline in Outputs, with Later Recovery



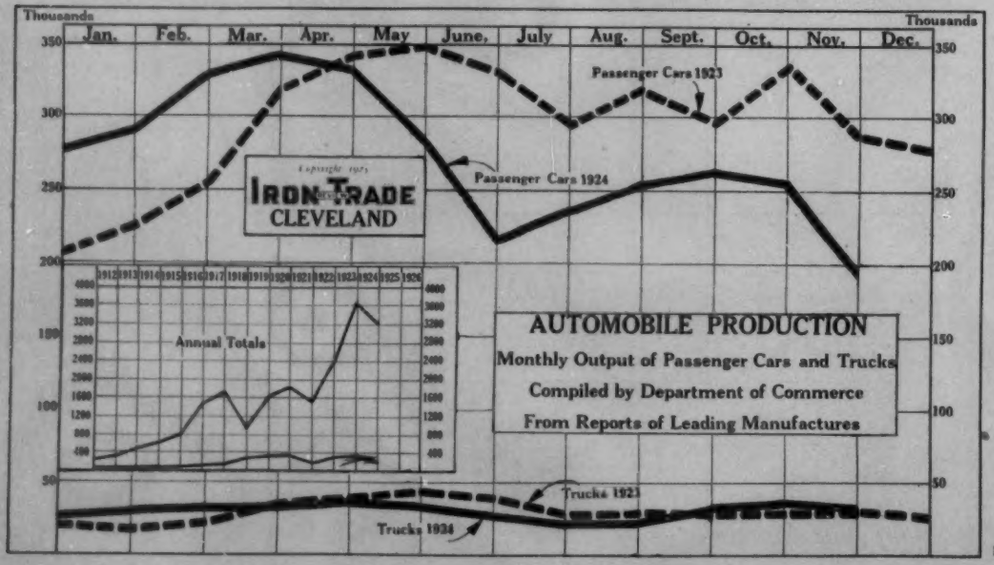
PRODUCTION in basic industries suffered a precipitate decline from an index of 120 in February to 93 in June. The percentage drop was 22 per cent. This was in sharp contrast with the recession in 1923 which amounted to but 12 per cent from the peak in May to the bottom in December. The decline in output in 1924 was much more rapid than the falling off in consumption. As a result, stocks began to dwindle, and buying slowly revived. In October the index stood at 109, a gain of 16 per cent from the bottom.

Employment Gaining After Sharp Depression During Summer Months

FACTORY employment during the past year has been at the lowest ebb of any period since 1921 and 1922. At the beginning of 1924 the level of employment was slightly above that for the same weeks of 1923. This advantage was soon lost, however. In 1923 employment held steady until June but in 1924 the decline began in April. The recession in the summer was much more drastic than it had been 12 months before. At the low point, factory payrolls were only 87 per cent as large as the 1919 average.



Automobile Production Has Dropped Below the Great 1923 Peak

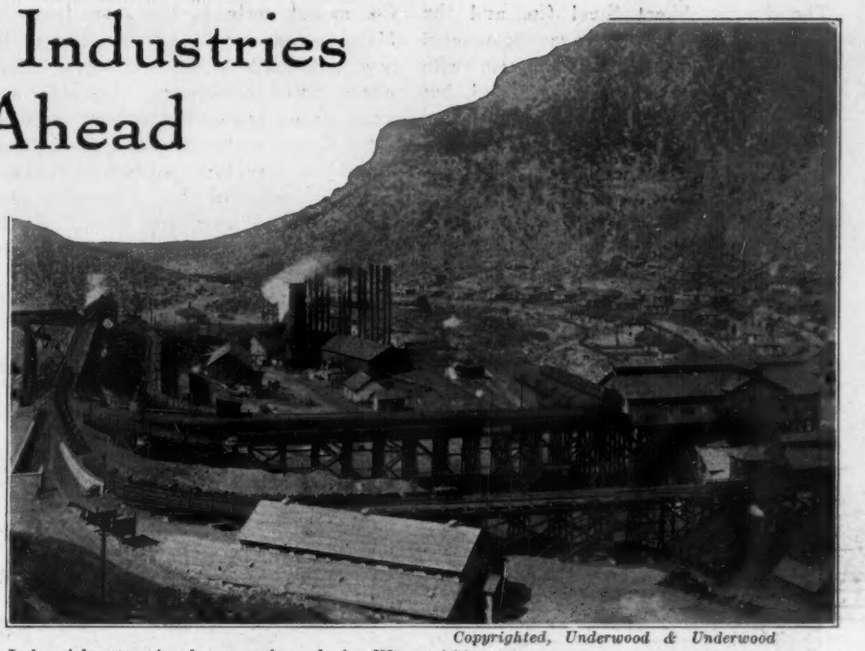


APPROXIMATELY 3,500,000 cars and trucks were produced in this country during 1924. This was a falling off of 12 per cent from the great output of 4,000,000 in 1924. The number of passenger cars made in the 11 months from January to November was 3,009,264, a decline of 10 per cent from the total for the same period of 1923. From January to November 333,572 trucks were produced against 348,557 in the same period of 1923, a loss of only 4 per cent. In the early months of 1924 cars were overproduced.

Pacific Coast Industries Are Forging Ahead

Remarkable Expansion Noted, Especially in Iron and Steel —Finished Products Now Made in Larger Tonnage— Foreign Pig Iron Finding Less of a Market—Eastern Companies Establishing Themselves in West

BY DON PARTRIDGE



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Industrial enterprise has transformed the West within the last 20 years. But much as it has done, the days of golden opportunities have just begun. This is a typical coal mining scene in Utah

DURING 1924 remarkable developments and expansions occurred in practically every line of manufacturing and commercial endeavor on the Pacific coast. This is especially true of the iron and steel industry. It has transformed from a district of relative unimportance that produced only small angles and shapes, and merchant and reinforcing bars from scrap material, into one that now makes pig iron, coke, wire products, nails, plates and sheets.

Possibly the cause of the slow development of the iron and steel industry on the west coast in the past was the lack of population. In recent years, however, rapid strides have been made along with the result that today the Pacific coast states are growing at a greater rate, proportionally, than any other section of the United States.

A recent survey made by one of the leading chambers of commerce in California showed the surprising total of over 7,000,000 people in the state. The estimated population of the seven western states, Oregon, Washington, Idaho, Utah, Nevada, Arizona and California is 10,000,000.

The importance of population is appreciated when it is known that the output of at least 90 per cent of all steel and metal working plants must be absorbed in the markets west of the Rocky mountains. Markets for western steel products will not be found in eastern territory until production costs are materially lowered, or freight rates substantially reduced.

New Plants are Added

By far the most important development of the year was the completion of the blast furnace and coke oven plant of the Columbia Steel Corp., at Provo, Utah, and the wire nail and sheet mill plants of this company, located at Pittsburg, Calif. What this corporation has accomplished inside of one year is noteworthy. It has constructed and put in operation a complete self-contained plant for the production of iron and steel and steel products, something no other company in this territory ever attempted before. The results that have been achieved are the more remarkable when it is realized that the work was undertaken and completed at a time when demand for steel was exceptionally light and when prices were at a low level.

The purpose of the blast furnace at Provo was primarily to supply basic iron for the company's open-hearth furnaces at Pittsburg, Calif. Prior to the time the furnace was put in blast, open-hearth charges consisted almost entirely of melting steel, eastern and foreign basic irons being used only occasionally and in small lots when a heat of special analysis was desired.

Mixtures of 40 per cent basic and 60 per cent melting steel to 50 per cent basic and 50 per cent melting steel now are being used at Pittsburg, resulting in quicker heats and longer life for the furnaces. The use of greater amounts of basic iron by all open-hearth operators on the coast is predicted. Iron not needed by the company in its basic open-hearth operations is marketed among independent iron and steel foundries on the coast.

Prior to the completion of the blast furnace approximately 90 per cent of the foundry iron used in the West was purchased from Scotland, Belgium and Germany. In the early part of the year the foundries placed with importers orders for large tonnages and the material had to be consumed before more iron could be purchased. Most of this material now has found its way into finished castings. As the analysis and price of the Provo iron corresponds favorably with the various grades of foreign iron the bulk of the tonnage placed recently has been for the domestic material.

Domestic iron can be shipped promptly, whereas foundrymen in the past have been compelled to anticipate their requirements months in advance due to the long time required to transport material from furnaces in Europe.

Use More Domestic Iron

One prominent pig iron dealer believes that at least 70 per cent of the foundry iron used from now on will be purchased in Utah. The effect produced on the Pacific coast markets for pig iron by the entrance of the Columbia company has been far more pronounced than in its entrance into the wire product and sheet markets.

Next in importance was the completion and the putting into operation of the sheet mill plant of the Pacific Sheet Steel Co., a subsidiary of the Metal & Thermit Corp. of New York, at South San Francisco.

This company was formed primarily to take care of the by-product of the Metal & Thermit's detinning plant, sheet metal scrap. While provision has been made for the installation of open-hearth furnaces on its large plant site, arrangements have been made with the Pacific Coast Steel Co., a short distance away, to run the scrap through the latter's open-hearth furnaces, of which it has six, and to roll the sheet bars for the former.

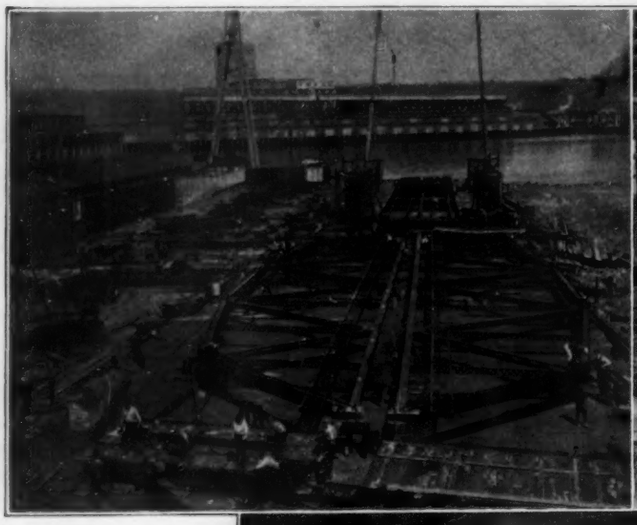
The Pacific Sheet Steel Co. and the Columbia Steel Corp. have encountered the usual difficulties in connection with the first operations of a sheet mill, but these are gradually being overcome and the product which finds its way into the hands of the trade is meeting with approval.

These two projects, the Columbia at Provo and Pittsburg and the Pacific at South San Francisco, were the outstanding developments of the year and Co. moved early in the year from its Mateo street site in Los Angeles to its new mill location at Huntington Park where three open-hearth furnaces and much new equipment has been installed.

At Torrance the Columbia Steel Corp. has taken over the open-hearth furnaces and bar mills of the Llewellyn Iron Works, which now are known as the Llewllyn plant of the Columbia corporation.

The Judson Mfg. Co., Emeryville, Francisco, for many years prominently identified with the steel industry. Plans are being prepared now for the erection of a large and modern warehouse when the lease on the present site expires. In the early part of December Little & Robertson, well-known distributors of steel products in the Los Angeles district, merged with A. M. Castle & Co., and a new and modern steel warehouse will be erected shortly in Los Angeles.

The acquisition of the Berger & Carter



DIVERSITY IS BECOMING ONE OF THE NOTABLE FEATURES OF WESTERN INDUSTRIAL PROGRESS. HERE WE HAVE A SHIP AND BRIDGE FABRICATING YARD; A FOUNDRY, AND A SHEET MILL, A FEW AMONG THE LATEST OF MODERN PLANTS

THE BRIDGE AND SHIP FRABRICATING YARD IS THAT OF THE WALLACE EQUIPMENT CO., SEATTLE, WASH.; THE FOUNDRY THAT OF THE PACIFIC MALLEABLE CASTINGS CO., OAKLAND, AND THE SHEET MILL, PACIFIC SHEET STEEL CO., SOUTH SAN FRANCISCO, A SUBSIDIARY OF THE METAL & THERMIT CORP., NEW YORK

are expected to exert a beneficial effect on the general welfare of the West. Through them the Pacific Coast has been placed on the map as a real steel producing center.

In Seattle the Pacific Coast Steel Co. has enlarged various departments of its Youngstown plant and has added a 20-inch mill for the rolling of universal plates. In addition a tie plate department has been added to take care of the increasing demand from the lumber and logging railroads. This company, at its South San Francisco plant, completed early in the year a large mill building for the exclusive handling and fabrication of galvanized steel transmission towers that are self-contained.

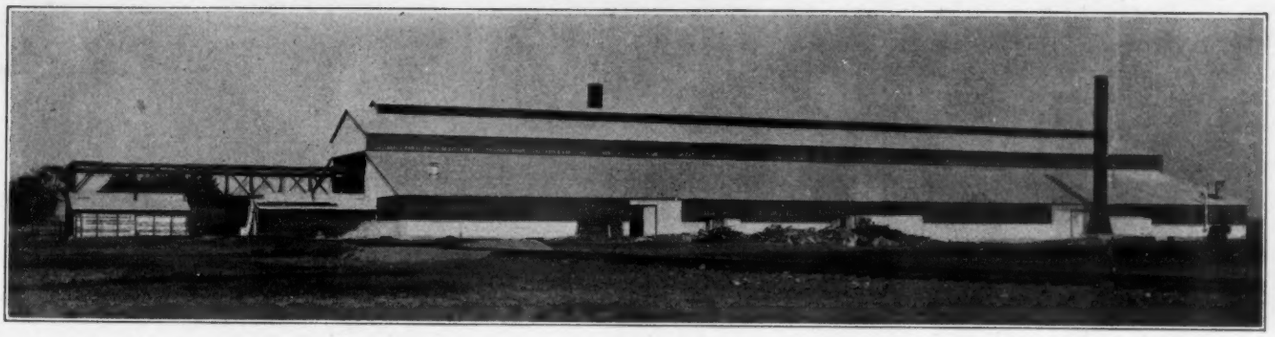
The Southern California Iron & Steel Calif., has made improvements and in addition has entered in a large way into the field for the fabrication of steel buildings and bridges.

During the year some interesting developments have occurred in the distributing business on the Coast. Outstanding among these was the erection by the United States Steel Products Co. in Los Angeles of the largest and most modern steel warehouse in the West, where thousands of tons of wire products, nails, sheets, shapes and plates are stored.

A. M. Castle & Co., Chicago, among the largest steel jobbers in the United States, have actively entered the distribution field on the coast. Several months ago they bought the distributing business of Berger & Carter Co., in San and Little & Robertson companies by A. M. Castle & Co., together with the A. M. Castle & Co. of Washington, located in Seattle, makes the company the leading distributor of heavy hardware on the Pacific coast.

In many quarters it is believed this signals the beginning of the time when the bulk of the steel distributing business will be handled by companies like A. M. Castle & Co., who specialize in nothing but heavy hardware.

The rapid residential, commercial and industrial expansion underway on the coast has put a greater demand on the fabricating shops than ever before, and many companies have enlarged their capacities and others now are planning extension programs for early completion.



WEST JOINS EAST IN MANUFACTURE OF MALLEABLE CASTINGS. THE PLANT OF PACIFIC MALLEABLE CASTINGS CO., OAKLAND, CAL., A SUBSIDIARY OF AN ILLINOIS COMPANY, IS ONE OF THE LATEST FOUNDRIES AMONG WESTERN INDUSTRIES

In the Northwest the Wallace Equipment Co., formerly the J. F. Duthie Shipbuilding Co. has erected a large fabrication shop and the Hofius Steel & Equipment Co. is preparing plans for a new plant site.

The entrance of the Moore Drydock Co. of Oakland into the general fabrication field in the early part of the year was one of the outstanding developments in the Bay district. Dyer Bros., Golden West Iron Works has made extensions and plans further additions during 1925.

Early in December the McClintic-Marshall Co. announced its intention of erecting one of the lagest fabrication shops on the coast in Los Angeles. This branch of the Pittsburgh company will operate under the name of the McClintic-Marshall Co. of California. Property has been purchased and the steel for the new buildings now is being fabricated in the East.

More eastern companies each year are establishing branch factories and plants on the Pacific coast, not only to take care of their increasing trade in the West but to be in a better position to fulfill the needs of the Far East.

Recently the Rockford Malleable Iron Works, Rockford, Ill., constructed the largest and most modern malleable casting foundry in the West. This plant is located in Oakland and operates under the name of the Pacific Malleable Castings Co.

The City of Oakland leads all other cities on the coast in the proportional increase of new industries. During the first ten months of 1924, 75 new industries constructed factories and started operations. Nine of them were Pacific Coast factories for national organizations.

Included among them was the completion of the new plant of the Westinghouse High Voltage & Insulator Co. on the 12-acre site of the parent company, the Westinghouse Electric & Mfg. Co., Hubbard & Co. of Pittsburgh, manufacturers of pole line hardware, railroad tool equipment, shovels, etc., have constructed a factory on a 3-acre site. The Illinois Wire & Cable Co., Sycamore, Ill., occupies a tract of six acres. The Detroit Steel Products Co. has doubled its original plant and the General Electric Co. has broken ground on its 23-acre site upon which will be erected the first copper wire drawing plant to be built on the Pacific Coast.

Eastern manufacturers of finished steel products and shelf goods as well as many of the steel producing companies have enlarged their sales organizations. Indicative of the growing market on the coast for all sorts of steel products, has been the increasing number of eastern manufacturing companies who have discontinued their manufacturer's agents arrangements and have opened direct branch offices.

Consumption of steel is steadily increasing as shown by the following figures. These totals are composed of awards of 100 tons or more reported each week in IRON TRADE REVIEW:

	Tons		
	1922	1923	1924
Concrete bar awards..	27,523	44,485	49,621
Cast iron pipe awards	39,132	73,798	86,474
Structural shape awards	88,369	85,477	129,037
Plate awards	68,088	193,805	32,040

It will be noted that all items show a substantial increase over the year, 1923, with the exceptions of plate awards. The falling off in plate tonnage is due almost solely to the fact that in the latter part of 1922 and most of the year, 1923, the oil companies in California had difficulty in caring for the tremendous production of the new oil fields. Consequently order after order was placed for oil storage tanks ranging in size from 37,000 to 178,000-barrel tanks. The bulk of the tonnage in 1922 and 1923 was for oil storage tanks. The pressing need of more storage tanks now is done away with. During the past year less than 20 80,000-barrel tanks and but four 100,000-barrel tanks were purchased.

Foreign competition in some lines of steel has been keen but with the exception of pig iron, rails, merchant bars and structural shapes at least 90 per cent of the material has been purchased from domestic mills.

The tonnage of foreign merchant bars and shapes consumed has been small in comparison to the total requirements. During the first nine months of 1924 at least 90 per cent of the pig iron was purchased abroad. With the operation of the Provo blast furnace the situation during the last quarter was nearly reversed. Of the 40,000 tons of rails reported by IRON TRADE REVIEW as having been placed during the year less than 25 per cent was foreign material. Practically the only buyers of European rails were the lumber and logging companies in the Northwest.

Closing days of the year find the outlook much improved in a market way. Construction activity is being well maintained both in the South and in the Northwest. Building permits issued in Los Angeles up to and including Dec. 9, totaled 1410 with an estimated value of $3,999,109 as compared with 1120 permits and a valuation of $3,505,938 for the corresponding peariod in November. Indications are that the total for Los Angeles this year will be close to $150,000,000. Other cities made similar records, construction being the most active industry along the coast, with less setback than others.

Oil development has been steady. Reports show 26 new wells started during the second week in December, bringing the total new wells for the year to 1308, compared with 1354 the previous year. Deepening jobs for the year number 815 while last year there were only 571 projects.

With such large building programs it is natural waterworks extensions should be large and extensions of mains have been of considerable size, making the market for cast iron pipe one of the most active departments of the iron and steel trade. This is continuing into the new year to meet demands arising from enlargement of inhabited areas of suburban cities.

Keen, far-sighted business men, in close touch with all things pertaining to industrial and commercial life on the Pacific coast, predict continued success and expansion of the steel industry.

Trend of Expansion Is Westward

Steelworks Capacity Completed Last Year Is the Largest Since 1920—Coke Oven Construction Surpasses the 1923 Building Program of Coking Units by 93 Per Cent—Over a Score of Blast Furnaces Are Remodeled

BY JOHN D. KNOX

WITH a goodly portion of its new furnace and mill equipment lying west of the Ohio-Pennsylvania state line, the drift of the iron and steel industry in 1924 continued slowly westward.

Fourteen of the open-hearth units completed in 1924 or 88 per cent were built west of Pennsylvania and nine of them or 56 per cent were in the states of Indiana and Illinois. Thus extending the center of the steelmaking industry in this country further westward from its pivotal point at Ashland, O.

Construction records for 1924, as shown in the accompanying tables, include numerous units installed in western territory. A new blast furnace at Provo, Utah, was blown in. Twenty-two per cent of the coke ovens fired for their initial campaign and 82 per cent of the coking units now being erected are located west of Pennsylvania.

Industrial expansion of iron and steel manufacturing facilities during the year just closed was highly satisfactory despite the cloak of dullness which held business in check the largest part of the four quarterly periods. New open hearths made available for production totaled 16 or eight more than were added to the country's steelmaking facilities in the building program of 1923. Moreover, the volume of new open hearth construction stamps 1924 as the most active year since 1920 in this respect. Only three blast furnaces have been completed in the United States in the past four years and one was built during the year just closed. Twenty-two stacks were remodeled in 1924 compared with five during the preceding year. Pig iron producers no longer are able to look on cost sheets with satisfaction especially when their attention is attracted to an item which reads like this: "18 bottom fillers and a foreman and three top fillers required to transfer ore, coke and stone from stock piles onto the bell." Little wonder, therefore, that the year just closed witnessed the replacement of hand charging facilities by skip bridges and the remodeling of numerous small stacks to enlarge the yield.

Expansion in the by-product coke industry also stamps 1924 as the best year since 1920. By-product ovens fired last year for their first campaign totaled 684. Approximately 9 per cent or 63 of the ovens completed were built primarily to secure the gas and are classified as gas oven plants. The remaining by-product ovens or 91 per cent of those completed last year were erected by iron and steel producers. The volume of new rolling mill construction tapered off last year, only 67 units being completed compared with 171 the year before. Every indication, however, points to the present year as a period which will be marked with prosperous activity in the way of new rolling mill construction. Scanning the accompanying data presented in tabular form strengthens this assertion. Practically all builders of rolling mill machinery view the outlook for 1925 with optimism and are inclined to believe the new year will benefit greatly from the sound basic conditions prevailing throughout the country.

Open-hearth furnaces under construction total eight and promise 560,000 tons annually to the steelmaking capacity of this country. Steelmaking furnaces which were scheduled for installation at the beginning of 1924 aggregated 16 with an estimated output of 1,110,000 tons annually. The preceding year 44 open hearths were slated for construction and were designed to yield 1,030,000 tons annually. This compared with four units which were included in the building program at the start of 1922 and had an estimated yield of 280,000 tons annually. Units in the course of construction, Jan. 1, 1921, totaled 12 and were rated to deliver 665,000 tons of steel annually while the 25 regenerative furnaces, included in the 1920 building program, promised an output of 1,392,000 tons. At the beginning of 1919 the number of open hearths upon which construction work had been started was 12, their rated capacities aggregating 1,005,000 tons. The record established in 1917 insofar as open-hearth steel tonnage is concerned never has been surpassed. During this period 102 units were laid down and these added to the country's steelmaking capacity 5,413,000 tons.

The total number of open-hearth furnaces built each year from 1913 to the beginning of 1925 together with the gross annual tonnages which have augmented the ingotmaking capacity of this country, is recorded as follows:

Year	Number of Furnaces	Gross Tons	National Ingot Cap.
1924.....	16	1,110,000	56,129,000
1923.....	8	535,000	55,019,000
1922.....	7	364,000	54,484,000
1921.....	13	620,000	54,120,000
1920.....	26	1,268,000	53,500,000
1919.....	23	1,871,000	52,200,000
1918.....	39	2,192,500	50,500,000
1917.....	102	5,413,000	48,500,000
1916.....	105	4,300,000	43,000,000
1915.....	43	1,750,000	39,000,000
1914.....	9	507,000	37,500,000
1913.....	62	3,120,000	37,000,000

In Table II are listed by respective companies the number of open-hearth furnaces built in this country during 1924 together with the resultant steel ingot capacity. The compilation, as shown, includes 16 units, 94 per cent of which are rated 100 tons capacity. Attention is directed to two companies, namely, the Otis Steel Co. and the Wisconsin Steel Co. which are newcomers into the basic open-hearth steelmaking industry. In addition the completion of the 16 open hearths last year enlarged the national ingot-

Table I

Recapitulation

	Completed 1924	Building 1924
By-product ovens	684	402
Blast furnaces	1	3
Open hearths	16	8
Rolling mills:		
Band	..	1
Bar	4	2
Billet and sheet bar	4	6
Black plate	..	12
Blooming	3	6
Edging	1	..
Merchant	4	8
Pipe, buttweld	1	5
Pipe, lapweld	..	1
Rerolling	1	..
Rod	..	1
Sheet, cold	8	13
Sheet, hot	14	10
Skelp	1	3
Strip, cold	26	..
Strip, hot	..	1
Structural	..	4
Universal	..	1
Total rolling mills	67	74
Electric furnaces:		
Booth	2	..
Heroult	2	..
Moore	2	..
Swindell	7	..
Unclassified	1	..
Total electric furnaces	14	..

making capacity 1,110,000 tons. Only upon four occasions in the past 12 years has the annual tonnage furnished by new open-hearth construction failed to exceed 1,000,000. Last year eight open hearths were included in the new construction reports and these added 535,000 tons capacity.

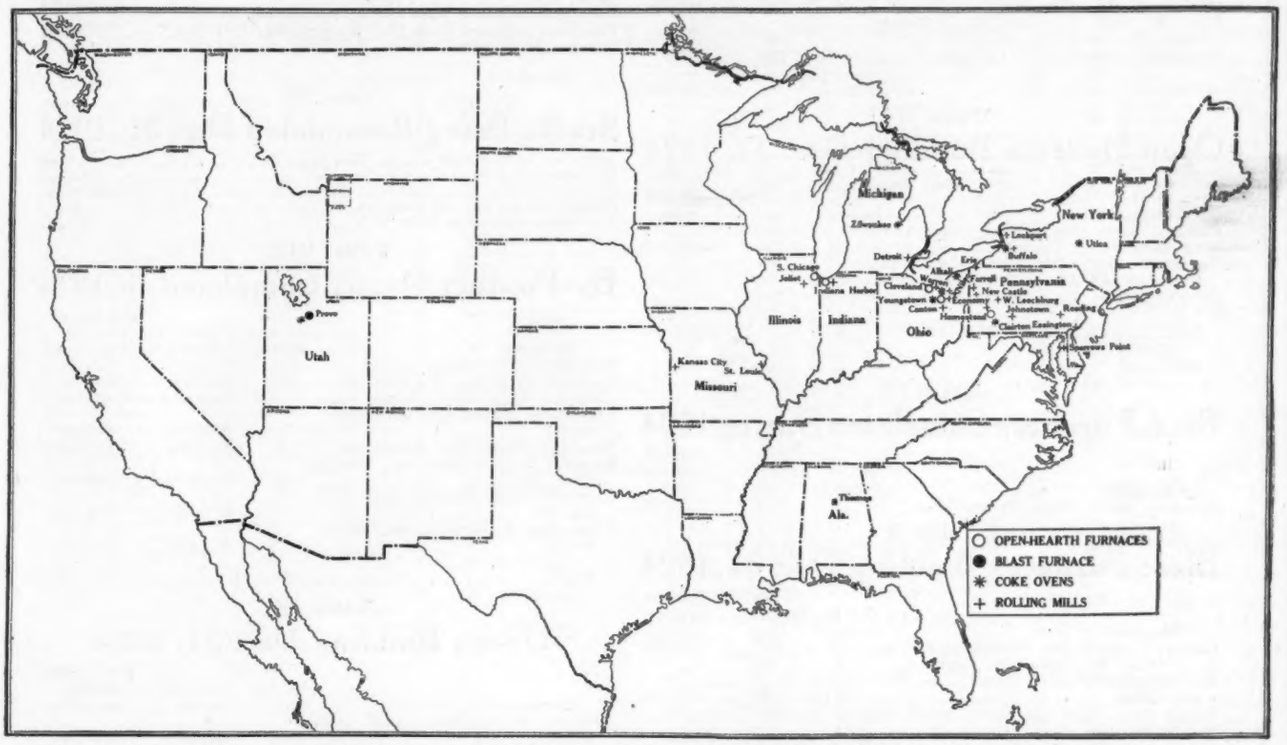
In excess of 5,000,000 tons of steelmaking capacity was added to the national output in 1917 when 102 open-hearth furnaces were laid down. One year later the tonnage afforded by new construction began to decline and this continued unchecked until 1922 when the annual yield of the seven new units built aggregated 364,000 tons. The following year the completion of eight open hearths with their total output of 535,000 tons registered a gain of 31 per cent compared with the output of the new units which began their initial campaign during 1922. As shown in Table II open-hearth construction during 1924 included 16 furnaces and added 1,110,000 tons to the national ingotmaking capacity. Last year's expansion program in this connection, therefore, yielded 52 per cent more tonnage than was afforded by the 1923 open-hearth additions and 67 per cent more output than was brought in by the 1922 units.

Construction of the new open-hearth furnaces last year with an aggregate annual output of 1,110,000 tons advances the total estimated steel ingotmaking capacity of this country to 56,129,000 tons. Twelve years ago an estimate of 37,000,000 tons was made by IRON TRADE REVIEW as representative of the ingot producing capacity of the United States. The ingotmaking capacity of this country from Jan. 1, 1914, to Jan. 1, 1925, therefore, has increased 19,129,000 tons or 51.7 per cent covering a period of approximately 11 years.

The tonnage added to the country's ingotmaking capacity this year as a result of new construction does not include the tonnage afforded by the enlargement of numerous steelmaking furnaces in the country. Early in 1924 the McKinney Steel Co., Cleveland, enlarged eight of its 14 open hearths to melt 110-ton heats. The Penn Seaboard Steel Corp., New Castle, Del., combined two 30-ton open hearths into a 50-ton unit. Plans call for the changing of two additional 30-ton units into a 50-ton furnace and for the construction of a third unit of similar capacity. Four 75-ton open hearths were rebuilt at the Duquesne works, seven at the Homestead works and three at the Farrell works of the Carnegie Steel Co. during the year just closed. Three 2-hole soaking pits were installed by the Timken Roller Bearing Co., Canton, O., last year to serve the new 35-inch blooming mill. The United Alloy Steel Co. also added two 4-hole soaking pit furnaces at its South division to provide sufficient capacity for its steelmaking department. One 4-hole unit was completed by the Mansfield Sheet & Tin Plate Co., Mansfield, O., while the Jones & Laughlin Steel Corp. enlarged the soaking installation serving the 40-inch blooming mill at the South Side plant from 24 to 42 pits.

Listed in Table VIII are 684 new by-product coke ovens which were completed in 1924. The total number of ovens placed in operation adds 4,297,500 tons to the coking capacity of the United States. This represents an increase of 93 per cent compared with the 301,600 tons which were supplied by 48 by-product units lighted for the first time in 1923. The completion of the 33 ovens in Utah marks the initial entrance of the by-product industry into western territory. In the 1922 program 133 ovens of the by-product type were built affording 597,000 tons additional while in 1921 the coking capacity added was 1,315,000 tons representing 283 ovens of the regenerative type. During 1920 by-product coke ovens installed amounted to 1213 and afforded 4,840,150 tons. The building program the year previous included 783 ovens and supplied 3,483,500 to the national output. New coking capacity completed in 1924, therefore, exceeded that completed in 1922 by 86 per cent, in 1921 by 69 per cent, in 1919 by 19 per cent but was 30 per cent less than the coking capacity laid down in 1920. The number of by-product ovens in the United States at the beginning of this year totaled 12,256, their annual coking capacity approximating 52,212,330 tons.

At the beginning of 1925, as shown in Table IX, 345 by-product coke ovens were being erected. These are



MAP SHOWING THE GEOGRAPHICAL LOCATION OF IRON AND STEELMAKING UNITS COMPLETED DURING 1924

designed for the production of 2,445,100 tons annually. Of the aggregate number of ovens under construction 307 or 76 per cent representing an annual output of 1,927,300 tons will serve the steel industry directly while steelmaking grades of iron. This stack is one of the few to be laid down in western territory in many years. Indications are that building schedules during the next few years will include few blast furnaces. During the war which now lean toward the merchant side, there is little reason to believe that construction schedules will include many new blast furnaces. Pig iron capacities in gross tons for all stacks placed in blast each year from

Equipment Completed or Building During 1924

Table II

Open Hearths Completed During 1924

Company	No. of furnaces	Rated capacity tons	Annual capacity tons
Carnegie Steel Co., Homestead, Pa.	2	100	140,000
Inland Steel Co., Indiana Harbor, Ind.	4	100	280,000
Otis Steel Co., Cleveland	4	100	280,000
Republic Iron & Steel Co., Youngstown, O.	1	85	60,000
Wisconsin Steel Co., S. Chicago, Ill.	5	100	350,000
Total	16		1,110,000

Table III

Open Hearths Building Dec. 31, 1924

Company	No. of furnaces	Rated capacity tons	Annual capacity tons
Carnegie Steel Co., Mingo Junction, O.	*7	100	.....
Ford Motor Co., Detroit	4	100	280,000
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.	4	100	280,000
Trumbull Steel Co., Warren, O.	†5	100	.....
Total	8		560,000

*Authorized.
†Projected

Table IV

Blast Furnaces Completed During 1924

Company	No. of furnaces	Daily capacity tons	Annual capacity tons
Columbia Steel Corp., Provo, Utah	1	350	120,750

Table V

Blast Furnaces Building Dec. 31, 1924

Company	No. of furnaces	Daily capacity tons	Annual capacity tons
Central Furnace Co., Massillon, O.	1	600	207,000
J. J. Gray, Jr., Rockdale, Tenn.	*1	350	.....
New England Fuel & Trans. Co., Everett, Mass	1	500	172,500
Pacific Coast Steel Co., Long Beach, Cal.	†1	350	.....
Toledo Furnace Co., Toledo, O.	*1	550	.....
Youngstown Sheet & Tube Co., Indiana Harbor, Ind.	1	600	207,000
Total	3		586,500

*Replacement
†Projected

Table VI

Stacks Remodeled During 1924

Company	Number or name
American Steel & Wire Co., Cleveland	"A"
Bethlehem Steel Corp., Lebanon, Pa.	"B" and "G"
Bethlehem Steel Corp., Johnstown, Pa.	"E"
Bourne-Fuller Co., Cleveland	Upson
A. M. Byers Co., Girard, O.	Mattei
Carnegie Steel Co., Duquesne, Pa.	No. 1
Illinois Steel Co., S. Chicago, Ill.	No. 5
Kelley Nail & Iron Co., Ironton, O.	Sarah
McKinney Steel Co., Cleveland	Nos. 1 and 2
Minnesota Steel Co., Duluth, Minn.	No. 1
Perry Iron Co., Erie, Pa.	Perry
Republic Iron & Steel Co., Youngstown, O.	Nos. 4 and 5
Tonawanda Iron Corp., Tonawanda, N. Y.	Niagara "A"
United Alloy Steel Corp., Canton, O.	United
Youngstown Sheet & Tube Co., E. Youngstown, O.	Nos. 1, 2 and 3
Youngstown Sheet & Tube Co., Youngstown, O.	No. 2
Youngstown Sheet & Tube Co., S. Chicago, Ill.	No. 4
Total	22

Table VII

Stacks Being Remodeled Dec. 31, 1924

American Rolling Mill Co., S. Columbus, O.	West
Deleware River Steel Co., Chester, Pa.	Deleware
Hanna Furnace Co., Leetonia, O.	Cherry valley
National Tube Co., McKeesport, Pa.	No. 1
Troy Coke & Iron Co., Troy, N. Y.	Burden

Table VIII

By-Product Ovens Completed in 1924

Company	No. of ovens	Type of ovens	Est. annual coking cap., tons
Bethlehem Steel Corp., Buffalo	114	Koppers	716,300
Carnegie Steel Co., Clairton, Pa.	366	Koppers	2,299,500
Columbia Steel Corp., Provo, Utah	33	Koppers	207,300
Consumers Power Co., Zilwaukee, Mich.	19	Koppers	119,400
Diamond Alkali Co., Alkali, O.	23	Koppers	144,500
Republic Iron & Steel Co., Youngstown, O.	61	Koppers	383,300
Trumbull Cliffs Furnace Co., Warren, O.	47	Koppers	295,300
Utica Gas & Electric Co., Utica, N. Y.	21	Koppers	131,900
Total	684		4,297,500

Table IX

Ovens Building Dec. 31, 1924

Company	No. of ovens	Type of ovens	Est. annual coking cap., tons
Alabama By-Products Corp., Birmingham, Ala.	25	Koppers	157,000
By-Products Coke Corp., S. Chicago, Ill.	110	Koppers	691,000
Consumers Power Co., Jackson, Mich.	15	Koppers	94,200
Illinois Steel Co., Gary, Ind.	140	Koppers	879,500
Lynn Gas & Electric Co., Lynn, Mass.	11	Koppers	69,100
Northern Indiana Gas & Electric Co., Fort Wayne, Ind.	19	Koppers	119,400
Philadelphia S. G. & Elec. Co., Philadelphia	25	Roberts	78,100
Republic Iron & Steel Co., Birmingham, Ala.	57	Koppers	356,800
Total	402		2,445,100

95 units or 24 per cent promising 517,800 tons of by-product coke annually are being laid down by public service companies.

Construction of blast furnaces in 1924, as shown in Table IV, was confined to a single stack which increased the annual estimated pig iron capacity of this country 120,750 tons. Pig iron producing capacity built in 1921 and 1923 also included one stack each while construction of blast furnaces in 1922 was neglected. The stack completed last year will be burdened largely on many steel manufacturers increased their pig iron capacity by building new stacks or purchasing units already erected. In addition mergers of the past few years brought more stacks into the fold of steel producers to the end that many steel companies now have excess producing capacity of the steelmaking grades of iron and hence have turned one or more furnaces onto the production of merchant grades. Until sufficient new open-hearth capacity is built to command the output of many steelwork's stacks, 1905 to 1924 inclusive, may be compared in the following table:

1924	120,750
1923	155,250
1922	None
1921	207,000
1920	1,138,500
1919	396,750
1918	1,425,000
1917	2,182,500
1916	530,000
1915	530,000
1914	None
1913	550,000
1912	1,000,000
1911	565,000
1910	1,794,000
1909	1,930,000
1908	1,188,000
1907	2,065,000
1906	1,135,000

Blast furnaces in the process of construction at the beginning of 1925 or upon which work will be started during the first quarter, as shown in Table V, total three. The stacks of the Youngstown Sheet & Tube Co. at Indiana Harbor, Ind., and of the New England Fuel & Transportation Co. at Everett, Mass., are slated for completion this year while contracts for the 600-ton unit to be erected at Massillon, O., by the Central Furnace Co. were let late in December. The work of driving the 9000 piles for the foundation of the stack of the New England Fuel & Transportation Co., at Everett, Mass., across the harbor from Boston was started in the month of October.

The 550-ton stack being built by the Toledo Furnace Co., Toledo, O., replaces a stack which has produced merchant iron for many years. The stack being built by J. J. Gray Jr., at Rockdale, Tenn., will be burdened for the production of ferrophosphorus and will be 70 feet high with a 12-foot hearth. On account of the peculiar difficulties and hazards incident to the manufacture of this product, the stack will be provided with a specially constructed gas-tight hearth and bosh. When completed the three new stacks listed in Table V will enlarge the pig iron producing capacity of the United States 586,500 tons annually.

Stacks remodeled during 1924 total 22. The majority of these were enlarged and five were equipped with skip hoists, bin systems and other facilities for economical handling and distribution of the raw materials. Thirteen of the stacks reconstructed are located in Ohio, five in Pennsylvania two in Illinois and one each in Minnesota and New York.

Blast furnaces now being remodeled include the West stack of the American Rolling Mill Co., S. Columbus, O.; the Cherry Valley of the M. A. Hanna Co., Leetonia, O.; the Delaware stack of the Delaware River Steel Co., Chester, Pa.; No. 1 of the National Tube Co., McKeesport, Pa.; the Burden stack of the Troy Coke & Iron Co., Troy, N. Y.; No. 2 stack at Duquesne, Pa., and No. 1 at Youngstown of the Carnegie Steel Co.; and No. 2 furnace of the Minnesota Steel Co., Duluth, Minn. The initial West furnace of the American Rolling Mill Co. is being dismantled and a new mantle ring, furnace shell and downcomers erected. During the forepart of last year the Troy Coke & Iron Co. took over the Burden Iron Co., at Troy, N. Y., and authorized the remodeling of the stack and erection of by-product coke ovens of the Foundation-type.

Records of the past year show seven obsolete stacks in this country were dismantled or were being dismantled as the year closed. The Carnegie Steel Co. salvaged its Zanesville stack at Zanesville, O., which was built in 1871 and produced approximately 50,000 tons annually. The Saucon furnace of the Thomas Iron Co. at Hellertown, Pa., which was originally built in 1870 and rebuilt in 1918 and the two Lock Ridge stacks of the same company at Albertis, Pa., which were built in 1867 and 1869 also were scrapped. Other stacks which passed out of existence

(*Concluded on Page* 117)

Rolling Mills Completed or Building During 1924

Table X

Rolling Mills Completed During 1924

Company	No. mills	Type mill
American Puddled Iron Co., Warren, O.	1	24″ bar
American Puddled Iron Co., Warren, O.	1	23″ blooming
American Sheet & Tin Plate Co., Farrell, Pa.	4	30″ hot sheet
American Steel & Wire Co., Cleveland	12	cold strip
Bethlehem Steel Corp., Johnstown, Pa.	1	34″ billet
Bethlehem Steel Corp., Sparrows Point, Md.	1	18″ edging
Blair Strip Steel Co., New Castle, Pa.	3	10″ cold strip
Central Tube Co., Economy, Pa.	1	buttweld pipe
Detroit Steel Corp., Detroit	2	7″ cold strip
Griffin Mfg. Co., Erie, Pa.	4	16″ cold strip
Illinois Rolling Mill Co., Joliet, Ill.	1	8″ belgium bar
Inland Steel Co., Indiana Harbor, Ind.	1	24″ billet
Inland Steel Co., Indiana Harbor, Ind.	1	14″ merchant
Kansas City Bolt & Nut Company, Kansas City, Mo.	1	16″ rerolling
Missouri Rolling Mill Corp., St. Louis	1	9″ merchant
Missouri Rolling Mill Corp., St. Louis	1	14″ merchant
Otis Steel Co., Cleveland	1	40″ blooming
Otis Steel Co., Cleveland	1	24″ sheet bar
Reading Iron Co., Reading, Pa.	1	18″ skelp
Reading Iron Co., Reading, Pa.	1	23″ bar
*Republic Iron & Steel Co., Youngstown, O.	1	billet-sheet bar
Seneca Iron & Steel Co., Buffalo	2	26″ cold sheet
Simonds Saw & Steel Co., Lockport, N. Y.	1	30″ hot sheet
Thomas Sheet Steel Co., Niles, O.	1	56″ balanced roughing
Timken Roller Bearing Co., Canton, O.	1	35″ blooming
United Alloy Steel Co., Canton, O.	1	20″ bar
Westinghouse Electric & Mfg. Co., Essington, Pa.	1	18″ merchant
West Leechburg Steel Co., West Leechburg, Pa.	5	16″ cold strip
Youngstown Sheet & Tube Co., Youngstown, O.	8	30″ hot sheet
Youngstown Sheet & Tube Co., Youngstown, O.	6	26″ cold sheet
Total	67	

*Replacement

Table XI

Rolling Mills Building Dec. 31, 1924

Company	No. Mills	Type Mill
Acme Steel Goods Co., Riverdale, Ill.	1	band
*Alan Wood Iron & Steel Co., Ivy Rock, Pa.	1	blooming
Allegheny Steel Co., Brackenridge, Pa.	1	12″ bar
American Tube & Stamping Co., Bridgeport, Conn.	1	22″ billet
American Tube & Stamping Co., Bridgeport, Conn.	1	9″ hot strip
Bethlehem Steel Corp., Buffalo	1	14″ structural
Bethlehem Steel Corp., Buffalo	1	28″ structural
Bethlehem Steel Corp., Buffalo	1	44″ blooming
Bethlehem Steel Corp., Johnstown, Pa.	1	14″ structural
Bethlehem Steel Corp., Johnstown, Pa.	1	14″ merchant
Bethlehem Steel Corp., Johnstown, Pa.	1	13″ merchant
Bethlehem Steel Corp., Johnstown, Pa.	1	12″ merchant
Bethlehem Steel Corp., Johnstown, Pa.	1	9″ merchant
Bethlehem Steel Corp., Reading, Pa.	1	12″ merchant
Bethlehem Steel Corp., Sparrows Point, Md.	1	rod
Bethlehem Steel Corp., Sparrows Point, Md.	12	28″ black plate
Bethlehem Steel Corp., Sparrows Point, Md.	6	cold mills
Carnegie Steel Co., Homestead, Pa.	1	44″ blooming
Carnegie Steel Co., Homestead, Pa.	1	36″ blooming
Carnegie Steel Co., Homestead, Pa.	1	28″ structural
Central Tube Co., Economy, Pa.	1	lapweld pipe
Clayton Mark & Co., Chicago	2	buttweld pipe
Colorado Fuel & Iron Co., Pueblo, Col.	1	merchant
Ford Motor Co., Detroit	1	42″ blooming
Ford Motor Co., Detroit	1	32″ billet
Ford Motor Co., Detroit	1	18″ billet-sheet bar
Ford Motor Co., Detroit	1	14″ merchant
Fort Dodge Culvert & Steel Co., Fort Dodge, Iowa	1	16″ belgium bar
Jones & Laughlin Steel Corp., Woodlawn Pa.	1	14″ merchant
National Tube Co., Gary, Ind.	2	16″ skelp
National Tube Co., Gary, Ind.	1	universal skelp
National Tube Co., Gary, Ind.	†5	buttweld pipe
National Tube Co., Gary, Ind.	†4	lapweld pipe
National Tube Co., Gary, Ind.	†1	seamless tube
Pacific Coast Steel Co., Youngstown, Wash.	1	22″ universal
Republic Iron & Steel Co., Youngstown, O.	1	buttweld pipe
Seneca Iron & Steel Co., Buffalo	6	30″ hot sheet
Seneca Iron & Steel Co., Buffalo	4	26″ cold sheet
Tenn. Coal, Iron & Railroad Co., Fairfield, Ala.	4	30″ hot sheet
Tenn. Coal, Iron & Railroad Co., Fairfield, Ala.	3	26″ cold sheet
Tenn. Coal, Iron & Railroad Co., Fairfield, Ala.	1	21″ sheet bar
Wisconsin Steel Co., Chicago	1	40″ blooming
Wisconsin Steel Co., Chicago	1	billet
*Youngstown Sheet & Tube Co., Youngstown, O.	1	18″ billet-sheet bar
Youngstown Sheet & Tube Co., Indiana Harbor, Ind.	2	buttweld pipe
Total	74	

*Replacements
†Reported in 1923; not included in total.

New Steel Demands Are Heavy

Beginning of New Year Marked by Same Active Market Conditions of Past Two Months—December Pig Iron Production Shows Large Gain—All Products Reflect Price Strength

THE market in iron and steel is beginning the new year with the continuation of the same conditions of briskly growing demand and production which have characterized the situation since early November. Steelworks operations remain at 80 to 85 per cent of ingot capacity. At Chicago they are at 90 per cent this week and the same rate holds true in the Youngstown district.

Railroad activity shows no letup. The Northern Pacific placed 1000 cars in the week and the Baltimore & Ohio is closing on 3000. The Chicago & Northwestern placed 45,000 tons of rails with one eastern and two Chicago mills.

IRON TRADE REVIEW composite of 14 leading iron and steel products begins the new year at $40.70 which is unchanged from the preceding week. One year ago it stood at $43.02.

Important among the new business closed is an order for 35,000 to 40,000 tons of pipe for the Hope Natural Gas Co. which has gone to the National Tube Co.

Pig iron production in December established a heavy gain, approximately 425,000 tons. This represents 16.9 per cent over November. December total is estimated at 2,940,000 tons.

Firmness and Activity Characterize Markets

STRONG prices, well-filled order books, good shipments, and prospects for steady buying for the second quarter, are the principal features of the pig iron market today. These have made of the customary holiday lull a period for reflection on the sound state of the market.

Prices in some districts have advanced. The lake furnace price now is $23, minimum. Chicago is $23.50, furnace, but tending to $24. Cleveland is at the single price level of $23, furnace, and the valley market is $22 to $23, base furnace.. Sales by the furnace interests with headquarters in Cleveland in December amounted to 150,000 tons.

Pittsburgh reports that while some makers of bessemer will not quote less than $23, valley, one or two sellers still name $22.50. Malleable is $22 to $23, valley. Low phosphorus copper-free iron is firm at $29, valley, minimum, and up to $29.50 is quoted on single carloads. Eastern reports show prices are strong. It is difficult to buy Buffalo foundry under $23, base furnace. The minimum on eastern Pennsylvania iron is $23.50 furnace for 2 plain, $24.25 to $24.50 for No. 2X and $25.50 for No. 1X. Prices are tending strongly toward $24, base furnace, and $24.50 being asked in some cases by certain producers.

Sales of basic iron are more in evidence. Two Ohio foundries closed during the week, one at Lima for around 1000 tons, and another at Alliance for about 5000 tons. The latter purchase, by the American Steel Foundries Co., was made at $21.50, valley. The basic market is quotable at $21.50 to $22, valley. The Andrews Steel Co., Newport, Ky., is reported to have closed for all of its basic requirements through the first four months.

Reinforcing Bars Dull

CONCRETE reinforcing bar demand is dull, with holiday quiet adding to the usual seasonal slump. Inquiries are many and estimating departments of fabricators are busy. Awards are small, and the aggregate placed is light. About 3500 tons of bars await immediate placement in Chicago. Olney J. Dean & Co. were awarded 650 tons for the Morrison hotel addition in Chicago. A wide range of prices is being quoted, the bulk of current business, going between 2.00c to 2.15c, Pittsburgh. Concrete bar interests are attempting to stabilize the market at 2.10c, Pittsburgh. For stock goods, prices usually are figured from a 2.30c to 2.60c, Pittsburgh base.

Shape Buying Steady

STRUCTURAL shape buying is heavy, with several sizable projects being closed recently. Possibility of higher prices after Jan. 1 has been a stimulant to buying. Activity outside of New York has tapered off, but considering the season, is at a good rate. Formulation of spring building programs now is under way and architects have much work ahead. Specifications from fabricators to the mills have been liberal on first quarter contracts, and shipments after Jan. 1 are expected to be heavy. Plain material prices have been strengthening until 2.00c, Pittsburgh, now is the firm quotation in most centers. In most cases, 2.10c, Pittsburgh, has been established as a market level and the tendency on the part of most interests is to firm up to that price. Among awards of the week are 1000 tons for the Wabash Portland Cement Co., Osborn, O., to Jones & Laughlin Steel Corp., and 1600 tons for an office building in Los Angeles, to the Baker Iron Works.

Bars End Year Strong

CONTRARY to usual experience at the end of the year the soft steel bar market shows considerable activity. Specifications and new business both are much in excess of usual practice in the closing days. Some makers in the Pittsburgh district have specifications in hand for seven or eight weeks ahead. At Chicago, specifications exceed new orders, though the latter represent a large tonnage and come from a wide range of consumers. Business is in lots of 50 to 1000 tons, representing a wide demand. Automobile builders are buying more freely. Bars are firm at 2.10c, Pittsburgh and Chicago.

Bar iron is dragging at 2.00c to 2.10c, Chicago, and for the refined grades, 2.90c to 3.00c at Pittsburgh. Rail steel bars are being booked in excess of shipments and backlogs are lengthening at Chicago.

Rail Tonnages Active

FORMAL orders against sizable inquiries for cars are expected to be awarded builders shortly. Locomotive buying includes 10 for the Central of

New Jersey. The Missouri Pacific is expected to close on 1000 gondolas in addition to 3000 recently placed, Northern Pacific, 1000 cars and 1500 underframes and 3000 cars for the Baltimore & Ohio. The Chicago & North Western railroad has placed about 45,000 tons of rails with the Illinois, Inland, and Bethlehem companies. The Illinois Steel Co. booked about 30,000 tons of the order. The Rock Island's 40,000 tons of rails are expected to be placed shortly after Jan. 1. About 8000 tons of rail fastenings still are to be awarded by the Chicago & North Western. Demand for billet rolled light rails are quoted at 1.80c to 1.90c, Pittsburgh, and if coal mining operations pick up extensively an increase of from $3 to $6 a ton is expected.

Pipe Mills Well Booked

PIPE mills are operating from 80 to 85 per cent of capacity. The largest recent line pipe order is the reported placing of a contract for 35,000 to 40,000 tons of 20-inch gas pipe for the Hope Natural Gas Co. The Humble Oil Co. is expected to inquire for 100 miles of 6 or 8-inch line pipe involving from 5500 to 7500 tons. Cast iron pipe demand is stronger at Chicago where Birmingham base on 6-inch and over now is $40 to $41, instead of a flat $40. St. Paul is placing 2500 tons and Detroit 5200 tons. About 1600 tons of cast pipe is pending in New York for municipal uses. United States Cast Iron Pipe & Foundry Co. has been awarded a contract for 1200 tons of cast pipe for use in Hamilton county, O.

Plate Market Firm

PLATE prices are firm, while demand shows indications of broadening. At Chicago, oil tank work probably exceeded 10,000 tons of plates during the week. Western roads, exclusive of the Baltimore & Ohio were expected to place 3000 cars before the end of the year, assuring the mills of some 30,000 tons of finished steel, mainly plates, early in January. Plates are 2.20c, Chicago. Producers at Pittsburgh are greatly encouraged over orders from fabricating shops. One of the large Mahoning valley producers is out of the market for the first quarter. Current prices range from 1.95c to 2.10c, Pittsburgh. Eastern platemakers are firm at 2.00c, base Pittsburgh. At Boston, plate sales have continued unusually active. Fabricators, warehouses, boiler makers and manufacturers have been buyers. The price is 1.90c, Pittsburgh, or 2.265c delivered.

Coke More Active

MORE interest is apparent in the coke market, despite the stronger price situation. A Connellsville producer took some first quarter business in the week at $3.50. A wage clause, however, makes the price to the pig iron producer $4.50. The Wickwire Spencer Steel Corp. has just closed a contract involving about 15,000 tons monthly for the second quarter at $4.90. Some coke producers show a tendency to hold prices in check. The spot beehive market is quoted at $4.25 to $5 while the contract price on the furnace grade is $5 to $5.50. Standard selected 72-hour foundry coke is usually quoted at $4.75 to $5.50 although as high as $6 is named on extended deliveries. Production of coke in the Connellsville region for the week ended Dec. 20 was 151,170 tons, compared with 141,260 tons in the preceding week, according to the *Connellsville Courier*. The market on standard by-product foundry coke delivered at Newark and other northern New Jersey points continues $10.41.

Tin Plate Outlook Good

PROSPECTS for 1925 are exceedingly favorable, according to tin plate producers. The first half is expected to more than make up for the lack of business during the closing half of 1924. Specifications in hand are heavy and considerable material on first quarter contracts is now in transit or is stored at the mills ready to ship out subsequent to Jan. 1 to the larger can companies. Some additional demand is developing abroad. The domestic price is firm at $5.50 per base box, Pittsburgh.

Semifinished Strong

WHILE new inquiries are developing occasionally for semifinished material, most of the present demand is in specifications on contracts. Some producers are sold out for the first quarter and have received specifications four to six weeks ahead. At Pittsburgh, billets now are at a minimum of $37, and up to $38 is quoted as a size differential, the small billet price being $38.50 to $40. On forging billets the minimum is $42, Pittsburgh. Some makers are firm at $43, minimum. The Universal Steel Co. is in the market for slabs. Sheet bars are held at $39 to $40. Wire rod are $48, Pittsburgh. Skelp is untested by large inquiries but producers are quoting 2.00c to 2.10c, Pittsburgh. Recent business in the East demonstrated that the minimum on open-hearth rerollers now is $37, base Pittsburgh. As high as $38.50 has been asked. Forging billets are about $5 above the price of rerollers. On wire rods the eastern market is generally firm at $47, base Pittsburgh.

Sheet Orders Larger

ORDERS continue to flow to sheetmakers. While some small sheet producers in the Pittsburgh district may take black at 3.50c, the usual quotation is 3.60c, as named by the American Sheet & Tin Plate Co. and several independents for first quarter. Blue annealed sheet specifications have been unusually heavy and an early advance from the 2.70c price is possible. Galvanized sheets are firm at 4.75c, Pittsburgh, and full finished sheets cannot be quoted at less than 4.75c.

The sheet situation in the Chicago district also is stronger and if prices do not open the New Year on a $2 higher basis they probably will step up shortly thereafter. Blue annealed sheets are especially strong and little first-quarter capacity is left. Western delivered prices figure back to 2.80c, Gary and Indiana Harbor, for blue annealed, 3.70c for black and 4.85c for galvanized.

Scrap Strong at End

UNLIKE the year end often met, the close of 1924 finds iron and steel scrap not only strong in anticipation of better conditions but consumers are buying steadily with less regard for the turn of the year than usual. Purchases thus late will not go into inventory and consumers see need for stock. Advances in quotations have been made the past week in nearly all centers, 25 cents to $1 being added to previous quotations on important grades. Greater activity, with somewhat restricted shipments from railroad stocks, promise a stronger market in January, as bookings by consumers call for operations requiring much raw material. Dealers

have been holding the whip hand in the present movement and buyers have resisted prices, but the advance continues without check.

Wire Has Usual Lull

APPROACH of inventory time and the customary holiday lull are blamed by makers of wire and wire products for the pocket into which the market has fallen. That jobbers will be heavy buyers in the first quarter to stock up for the expected spring demand is not doubted. Mill operations show little shrinkage. Prices are unchanged, western delivered prices figuring back to 2.70c, base Joliet and Waukegan, for plain wire and 2.95c for wire nails. At Pittsburgh prices are firm at 2.60c for plain wire and 2.85c for nails.

By-Products Steady

TRADING in light oil distillates continues brisk at unchanged prices. Current sales of sulphate of ammonia are composed of scattered tank lots for spot shipment. The price for export account nominally is $3, for material in double bags at seaboard. It is believed, that if sellers were to book foreign business, it would have to be done at a lower figure. Contracting in naphthalene for spring shipment continues around 5½ cents for flakes in carload lots, and 6½c for balls. Slightly higher prices are reported done in some instances. Phenol is steady at 27 cents works local warehouse for spot shipment and 25 cents works for futures.

Metals Strong at Close

METALS continued their strength right up to the end of the year. December was surprising in advances by copper, zinc and lead, and so the action ran right through the holidays despite their reputation for quietness. Copper reached the much-discussed 15.00c mark and about the same time the government reported November exports at a volume equaled only four months previously in all history. Lead went to 9.60c New York for contracts and 10.15c in the open market. Zinc crossed 7.70c St. Louis and tin went to 58.00c and more. These were the highest prices of the year. December buying was heavy, but quiet in the past few days.

Machine Tools Apathetic

DESPITE award of 40 machine tools for the Essex county vocational school, Irvington, N. J., and several smaller orders by industrial companies, the equipment market still reflects the apathy of holiday dullness. Nash Motors Co. is buying production tools. Prospects for 1925 business are bright and two eastern machine tool builders have announced slight price increases. Railroad lists are light and little activity is expected from that source until 1925 appropriations are available and requirements listed. Used tools continue dull with competition keen on standard machiine business. Featuring crane awards was the award placing of 12 by the General Electric Co., Schenectady, N. Y., for West Philadelphia, Pa., and Detroit.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Dec. 24, 1924	Nov., 1924	Sept., 1924	Dec., 1923
PIG IRON				
Bessemer valley, del., Pitts.	$24.26	22.11	21.76	24.17
Basic, valley	21.50	19.25	19.00	20.50
Basic, eastern del., eastern Pa.	23.63	21.46	20.00	23.30
*No. 2 foundry, del. Pitts.	23.76	21.36	21.26	23.77
No. 2 foundry, Chicago	23.50	21.00	20.50	23.00
*Southern No. 2, Birmingham.	20.00	17.90	17.65	20.75
*Southern Ohio, No. 2, Ironton	22.00	20.90	20.00	22.50
**No. 2X, Virginia furnace	24.50	24.50	24.50	24.50
**No. 2X, eastern, del. Phila.	25.13	22.98	21.26	24.26
Malleable, valley	22.00	19.75	19.50	21.50
Malleable, Chicago	23.50	21.00	20.50	23.00
Lake Superior charcoal, Chicago	29.04	29.04	29.04	29.04
Gray forge, val., del Pittsburgh	23.26	20.76	20.76	23.27
Ferromanganese, del., Pitts.	109.79	107.29	97.79	113.79
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	39.00	37.00	37.50	42.50
Sheet bars, open-hearth, Pitts.	39.00	37.00	37.50	42.50
Billets, bessemer, Pittsburgh	36.00	35.50	37.10	40.35
Billets, open-hearth, Pittsburgh	36.00	35.50	37.10	40.35
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.10	2.05	2.05	2.40
Steel bars, Chicago	2.10	2.05	2.05	2.50
Steel bars, Philadelphia	2.32	2.295	2.37	2.72
Iron bars, Philadelphia	2.47	2.345	2.32	2.62
Iron bars, Chicago mill	2.00	2.10	2.15	2.40

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Dec. 24, 1924	Nov., 1924	Sept. 1924	Dec., 1923
FINISHED MATERIAL (Continued)				
Beams, Pittsburgh	2.10	2.00	2.00	2.50
Beams, Philadelphia	2.32	2.12	2.22	2.72
Beams, Chicago	2.20	2.15	2.10	2.60
Tank plates, Pittsburgh	1.95	1.85	1.95	2.50
Tank plates, Philadelphia	2.32	2.02	1.97	2.72
Tank plates, Chicago	2.20	2.15	2.10	2.60
Sheets, blk., No. 28, Pittsburgh	3.60	3.45	3.45	3.75
Sheets, blue anl., No. 10, Pitts.	2.70	2.60	2.70	2.95
Sheets, galv., No. 28, Pittsburgh	4.75	4.60	4.60	4.90
Sheets, black, No. 28, Chicago	3.75	3.65	3.75	4.10
Sheets, blue anl. No. 10, Chicago	2.85	2.85	2.95	3.35
Sheets, galv. No. 28, Chicago	4.90	4.75	4.85	5.20
Wire nails, Pittsburgh	2.85	2.75	2.80	3.00
Wire nails, Chicago	3.00	2.95	3.10	3.35
COKE				
Connellsville furnace, ovens	4.50	3.00	3.00	3.85
Connellsville foundry, ovens	5.75	4.05	4.00	4.80
OLD MATERIAL				
Heavy melting steel, Pittsburgh	21.50	19.85	18.60	18.35
Heavy melting steel, eastern Pa.	21.00	18.05	17.75	16.80
Heavy melting steel, Chicago	19.50	17.05	16.40	16.00
No. 1 wrought, eastern Pa.	20.50	18.95	18.75	19.00
No. 1 wrought, Chicago	19.25	17.10	16.70	16.35
Rails for rolling, Chicago	20.75	18.20	17.40	17.05

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

Dec. 24, 1924	Dec. 17, 1924	Nov., 1924	September, 1924	Dec., 1923	Dec., 1914
$40.70	$40.14	$39.00	$39.05	$43.02	$21.58

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structura Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

Pig Iron

Prices per gross ton

Bessemer, valley	$22.50 to 23.00
Bessemer, Pittsburgh	24.26 to 24.76
Basic, valley	21.50 to 22.00
Basic, Pittsburgh	23.26 to 23.76
Basic, Buffalo	22.50 to 23.00
Basic del., eastern Pa.	23.50 to 24.00
Malleable, valley	22.00
Malleable, Pittsburgh	23.76
Malleable, Cleveland, del.	23.50
Malleable, Chicago	23.00
Malleable, Buffalo	23.00
Malleable, del., eastern Pa.	25.50 to 27.01

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eas'n and Virgina	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	26.26
No. 1X, Buffalo	24.50
No. 1 foundry, Chicago	24.00
No. 2 foundry, valley	22.00 to 23.00
No. 2 foundry, Pittsburgh	23.76 to 24.76
No. 2 foundry, Buffalo	23.00
No. 2 foundry, Chicago	23.00
No. 2 foundry, Granite City	24.00 to 24.50
No. 2 foundry, Ironton fur.	22.00 to 22.50
No. 2 foundry, Cleveland, del.	23.50
No. 2 foundry, del., Phila.	24.63 to 25.26
No. 2 foundry, N. J., tidewater	24.63 to 25.39
No. 2X, eastern del., Phila.	25.13 to 26.76
No. 2X, east. N. J. tidewater	25.76 to 26.39
No. 2X, eastern del., Boston	27.65
No. 2X, foundry, Buffalo fur.	23.50
No. 2X, Buffalo, del., Boston.	27.91 to 28.41
No. 2 southern, Birmingham	20.00
No. 2 southern, Cincinnati	24.05
No. 2 southern, Philadelphia	27.80
No. 2 southern, Chicago	26.01
No. 2 southern, Cleveland	26.01
No. 2 southern Boston (rail and water)	26.91
No. 2 southern, St. Louis	24.17 to 25.17
No. 2X, Virginia furnace	24.50 to 25.00
No. 2X, Virginia, Phila.	29.67 to 30.17
No. 2X, Virginia, Jersey City	30.04 to 30.54
No. 2X, Virginia, Boston	30.42 to 30.92
Gray forge, eastern Pa.	23.00 to 23.50
Gray forge, val. del., Pitts.	23.26 to 24.26
Low phos., standard, valley	29.00 to 29.50
Low phos., standard, Phila.	29.79
Low phos., Lebanon, furnace	26.00
Charcoal, Birmingham	30.00
Charcoal, Superior, Chicago	29.04

Silvery iron, Jackson county, Ohio, furnace, 7 to 8 per cent, $29.00; 8 to 9 per cent, $30.50; 9 to 10 per cent; $32.50; 10 to 11 per cent, $34.50; 11 to 12 per cent, $37.00; 12 per cent, $39.50.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 to 11 per cent, $39.50; 11 to 12 per cent, $42.00; 12 to 13 per cent, $44.50.

Ferroalloys

†Ferromanganese 78 to 82 per cent. tidewater, or furnace first hand and resale	$110.00
Ferromanganese delivered Pittsburgh	114.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	32.00 to 34.00
Ferrosilicon, 50 per cent contract freight allowed	80.00 to 82.50
Ferrotungsten standard, cents per pound contained	82.00 to 88.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, del.	11.00 to 11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.25 to 3.75
Ferro-carbon-titanium, car lots, producer's plant, net ton	200.00

†Duty paid.

Coke

Beehive, Ovens
Prices per net ton

Connellsville, furnace	4.25 to 5.00
Connellsville foundry	4.75 to 6.00
New river foundry	8.50 to 9.00
Wise county furnace	4.00 to 4.25
Wise county foundry	4.50 to 5.00
Alabama furnace	4.00 to 4.50
Alabama foundry	4.50 to 5.25

By-Product

Foundry, Newark, N. J., del.	$10.41
Foundry, Chicago, ovens	10.75
Foundry, New England del.	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Alabama	4.50 to 5.25

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS
4 x 4-inch and larger

Pittsburgh and Youngstown	$37.00 to 38.00
Philadelphia	41.80 to 43.80
Chicago	35.00 to 38.00
Forging, Pittsburgh	42.00 to 43.00
Forging, Philadelphia	46.80 to 48.80

SHEET BARS

Pittsburgh and Youngstown	39.00 to 40.00

SLABS

Pittsburgh	37.00 to 38.00
Youngstown	36.00 to 37.00

WIRE RODS
¼-inch and finer

Pittsburgh	$48.00
Cleveland	48.00
Chicago	49.00 to 51.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.00c to 2.10c
Universal skelp, Pittsburgh	2.00c to 2.10c
Sheared skelp, Pittsburgh	2.00c to 2.10c

Structural Shapes

Prices per pound

Pittsburgh	2.10c
Philadelphia	2.32c to 2.42c
New York	2.34c to 2.44c
Chicago	2.20c
Cleveland	2.19c to 2.29c
Birmingham	2.15c to 2.20c

Steel Plates

Pittsburgh	1.95c to 2.10c
Philadelphia	2.32c
New York	2.34c
Chicago	2.20c
Cleveland	2.14c to 2.19c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.10c
Pittsburgh, cold finishing	2.25c
Pittsburgh, forging quality	2.35c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
Cleveland, soft steel	2.29c
Birmingham, soft steel	2.25c to 2.30c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	2.90c to 4.50c
Pittsburgh, reinforcing billet	2.10c
Chicago, rail steel	2.03c
Mill rail steel	1.90c to 2.00c
Philadelphia, common iron	2.47c
New York, common iron	2.49c
Chicago, common iron	2.00c to 2.05c

Hoops, Bands, Strip

Prices per pound f.o.b. mills

Hoops, Pittsburgh, under 3 in.	2.40c to 2.50c
Hoops, Pittsburgh, 20 gage, under 1 in	2.75c to 3.75c
Bands, Pittsburgh	2.40c to 2.50c
Hot rolled strip steel, Pittsburgh stamping quality	2.40c to 2.50c
Cold rolled strip steel, hard coils 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh, Cleveland.	4.00c to 4.15c

Chicago and Worcester, Mass. $3 per ton higher.

Cold Finished Steel

Prices per pound

Cold finished steel bars, drawn or rolled Pittsburgh, Chicago, carloads	2.80c
Less carloads	3.05c
Steel shafting, turned and polished Pittsburgh, Chicago	2.80c

Screw stock base Cleveland $1 higher; and Worcester $3 higher than Pittsburgh and Chicago.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	27.00 to 30.00
Light rails, 25 to 45, mill	1.80c to 1.90c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.90c
Spikes, small railroad, 7/16-inch and smaller, Pittsburgh	3.20c
Spikes, boat and barge, Pitts.	3.25c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. standard	3.75c to 4.00c
Track bolts, Chicago	3.90c
Tie plates, Pittsburgh	2.35c to 2.50c
Tie plates, Chicago	2.35c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads
Prices per pound

F.o.b. Cleveland and Pittsburgh base

Wire nails	2.85c
Galv'd nails, 1-inch and over	5.10c
Plain wire	2.60c
Annealed wire	2.75c
Galvanized wire No. 9 gage	3.20c
Barbed wire, painted	3.30c
Barbed wire galvanized	3.55c
Polished staples	3.30c
Galvanized staples	3.55c
Coated nails, count keg	2.25c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7 bars and 12-in. stays per 100 rods, f.o.b. Pittsburgh	$20.56

Joliet, DeKalb and Waukegan, Ill., $2 per ton over Cleveland-Pittsburgh base on products made there. Worcester, Mass., and Fairfield, Ala., $3 higher. Duluth $2 higher. Chicago delivered price $3 higher, Anderson, Ind., $1 higher.

Sheets

Prices per pound

SHEET MILL BLACK

No. 28, Pittsburgh base	3.60c
No. 28, Philadelphia, delivered	3.82c to 3.92c
No. 28, Gary, Indiana Harbor	3.70c
No. 28, Chicago, delivered	3.75c

TIN MILL, BLACK

No. 28, Pittsburgh base	3.60c
No. 28, Gary base	3.70c

GALVANIZED

No. 28, Pittsburgh, base	4.75c
No. 28, Philadelphia, delivered	4.92c to 5.07c
No. 28, Gary Indiana Harbor	4.85c
No. 28, Chicago, delivered	4.90c

BLUE ANNEALED

No. 10, Pittsburgh base	2.70c
No. 10, Philadelphia, delivered	3.02c to 3.12c
No. 10, Gary, Indiana Harbor	2.80c
No. 10, Chicago, delivered	2.85c

AUTOMOBILE SHEETS

No. 22, Pittsburgh, base	4.75c

Tin Plate

Prices per 100-pound box, Pittsburgh

Tin plate, coke base	$5.50

Gary, Ind. base 10 cents higher

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less and $4 per ton higher. Chicago delivered 2½ points less and $5 per ton higher.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—f.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Chain, Piling, Cut Nails

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.25c
Sheet piling base, Pittsburgh	2.00c to 2.15c
Cut nails, f.o.b. mills	4.90c

Hot Rolled Alloy Steels

Price per pound, Pittsburgh base

S. A. E. Series—	
2300 (3½ per cent nickel)	4.75c
3100 (nickel chromium)	3.65c to 3.75c
6100 (chrome vanadium)	4.50c to 4.75c
6100 (Chrome vanadium spring)	4.00c to 4.25c
9250 (Silico manganese spring)	3.15c to 3.50c

Billets—4 x 4 to 10 x 10, gross ton at net ton bar price; under 4 x 4 to 2½ x 2½-inch, $5 higher.

Chicago base $2 per ton above Pittsburgh.

Steel Imports, Exports Decrease in 1924

Foreign trade of the United States in iron and steel decreased in 1924 from the levels of the preceding year, according to estimates based on figures of the department of commerce. Whereas exports totaled 2,009,141 tons in 1923, shipments in the year just ended will approximate 1,875,000 tons. Imports totaled 734,734 tons in 1923 while in 1924 they approximated 550,000 tons. Decreases in exports were noted in most products, the largest tonnage drop occurring in steel bars, structural shapes and rails. Marked increases were noted in pig iron, scrap, steel sheets, tin and terne plate, casing and oil line pipe and barbed wire. Imports showing an increase in 1924 over 1923 were steel ingots, bars, etc., structural shapes, rails, boiler and other plate, sheets and saw plates, wire rope and insulated wire, wire rods, tubular products, and flat wire and strip steel. Increase in tubular products was most pronounced, increasing from 4900 tons in 1923 to approximately 52,000 tons in 1924. Despite the many increases, the import total was less in 1924, due largely to less tonnage taken in pig iron, ferromanganese, ferrosilicon, scrap, bar iron, and tin plate. Ore imports also were lighter in 1924.

Will Expand Mingo Plant

Pittsburgh, Dec. 30.—An appropriation of $5,500,000 for expanding the mills of the Carnegie Steel Co. at Mingo Junction, O., has been approved, according to a statement by Homer D. Williams, president of the company. Seven open-hearth furnaces will be built immediately, the new buildings to be erected on the Ohio river south of the present mills. Additional finishing equipment will be put in later.

William Whigham Dies

William Whigham, vice president of the Carnegie Steel Co., Pittsburgh, died Dec. 23 at his home in the Schenley apartments there at the age of 58 years. Mr. Whigham was born in Allegheny county, Pa., Jan. 4, 1866. He was graduated from the Stevens Institute of Technology, Hoboken, N. J., in 1888 with the degree of bachelor of mechanical engineer. In July 1892 he became connected with the Carnegie Steel Co. as a draftsman in the armor plate department at the Homestead works. From the position as steam engineer he was made superintendent in 1902 of the Howard Axle Works, a department of the Homestead plant. In 1905 he was appointed assistant to the president of the Carnegie Steel Co., in which place he continued until 1915 when he was elected vice president in charge of operations and a director of the company. Mr. Whigham was instrumental in Ohio river improvement and the development of the river transportation. Besides being a vice president of the Carnegie Steel Co. he was a director of the H. C. Frick Coal Co., Sharon Coal & Coke Co., and Bessemer Electric Power Co.

Pacific Coast Steel Companies Merged

Pacific Coast Steel Co., San Francisco, has announced the acquisition of the plant of the Southern California Iron & Steel Co., Los Angeles. Changes will be made in the plant's directorate, according to A. C. Denman, Jr., president of the Los Angeles company. The Pacific Coast Steel Co. has plants in South San Francisco, Seattle, and Portland, Oreg. The company was incorporated in 1909 as a consolidation of the Portland Rolling Mills, the Seattle Steel Co., and the Pacific Coast Steel Co. The company manufactures open-hearth steel products, and has an annual capacity of 300,000 tons. The plant of the Southern California Iron & Steel Co. consists of open-hearth steel capacity of 28,000 tons annually, bar mills and a nut and bolt factory. Elliott M. Wilson and D. E. McLaughlin, San Francisco, are president and vice president of the Pacific Coast Steel Co.

Employes Receive Bonus

St. Louis, Dec. 29.—Nearly 2300 employes of the Commonwealth Steel Co. shared in a $60,000 Christmas bonus, all who have been with the company six months or longer participating. The checks were accompanied by a personal letter from Clarence H. Howard, president, expressing his satisfaction with the success of the Golden Rule plan, under which the company operates, and whereby the employes receive a percentage of the profits.

Coast Steelmakers Meet

San Francisco, Dec. 27.—The California development board is calling a meeting of all manufacturing companies in California who use steel products, with coast mill operators and fabricators at Del Monte Jan. 22 and 23 to discuss ways and means for furthering the best interests of the steel industry on the Pacific coast. This is the first time such a gathering has been held and the trade is vitally interested in the outcome.

Chamber To Make Survey of Distribution

Washington, Dec. 30.—One hundred and fifty business men, manufacturers, wholesalers and retailers, economists and representatives of the consuming public were invited today by Richard F. Grant, president, Chamber of Commerce of the United States, to participate in the national conference on distribution, the first meeting of which will be held under the auspices of the chamber, in Washington, Jan. 14 and 15.

The purpose of the meeting is to map out the field of inquiry to be covered by the conference in a study of prevailing methods of merchandising. Committees will be designated to take up various phases of the problem and their reports will be submitted later to a general meeting of the conference for scrutiny and approval. In a statement announcing the conference Mr. Grant said:

"It has become apparent to business men, manufacturers, producers and merchants, as well as to the general public that an important field of economic study lies within the range of marketing activities that have to do with the transfer of goods from the producer to the consumer.

"Viewed at long range, methods of production are being constantly improved. Costs of production are being reduced through better management and organization, the perfection of new processes and the wider use of machinery. This accomplishment has been due in no small measure to a better knowledge of conditions affecting manufacture and production.

"The distribution of commodities and articles of common use is as important a factor in the fixing of the price to the ultimate consumer as the producing of them. The system that has been built, is the only system we have or can have for many years to come. Before we can pass upon it intelligently or reply effectively to any criticism, a better understanding of it is necessary. Undoubtedly the processes of distribution are undergoing constant change and improvement, but these changes are often lost sight of because they are not immediately reflected in a reduction of prices to the consumer.

"Statements and counterstatements are made as to what is wrong. The consuming public frequently attributes the price spread between producer and consumer to excessive profits. Injudicious buying suffers with injudicious selling the blame for what appear to be excessive costs. The producer, the wholesaler, and the retailer are collectively criticized for conditions beyond their single control.

"The problem of distribution cannot be weighed intelligently nor can improvements be made in existing methods until there has been a competent survey of conditions of distribution and a compilation of facts relating to it necessary to a conclusion."

1924 Pig Iron Production Drops

December Output of Approximately 2,940,000 Tons Brings Year's Total to 31,060,183 Gross Tons, a Drop of 8,965,667 Tons from 1923 — Gain of December Over November Is 425,000 Tons

PRODUCTION of coke and anthracite pig iron in the United States in 1924 aggregated 31,060,183 gross tons, a drop of 8,965,667 tons from the 40,025,850 tons of 1923, the record year of history. The outputs of 1921 and 1922 were exceeded by wide margins, however. During the first half of 1924, production totaled 17,423,417 tons, as against 13,636,766 tons during the last half, the difference being 3,786,651 tons. As compared with the output of 19,197,449 tons during the last six months of 1923, the last half of this year showed a loss of 5,560,683 tons. In 1923, pig iron was made at the rate of 108,659 tons per day, as against the rate of 84,864 tons per day during the past year. The corresponding rates for 1922 and 1921 were 73,563 and 45,223 tons, respectively.

The output of pig iron in December totaled approximately 2,940,000 gross tons, according to partially estimated returns to IRON TRADE REVIEW from blast furnaces which, during October and November, made 72 per cent of the country's total. This indicates a gain of about 425,000 tons, or 16.9 per cent, over the November total of 2,514,979 tons. Average daily production for December was 95,000 tons, which, compared with the 83,832-ton rate of November, was an increase of about 11,200 tons, or 13.3 per cent.

MONTHLY PRODUCTION

	1924	1923	1922
January	3,015,480	3,223,226	1,645,804
February	3,073,619	2,993,918	1,630,180
March	3,465,389	3,523,595	2,035,908
April	3,226,107	3,546,308	2,070,161
May	2,619,986	3,868,486	2,309,348
June	2,022,836	3,667,868	2,362,455
Total 1st half..	17,423,417	20,828,401	12,053,856
July	1,783,457	2,684,677	2,403,030
August	1,882,986	3,448,886	1,810,665
September	2,053,617	3,117,526	2,024,008
October	2,461,727	3,142,642	2,629,655
November	2,514,979	2,891,191	2,846,110
December	2,940,000	2,912,527	3,083,520
Total 2nd half..	13,636,766	19,197,449	14,796,988
Grand total..	31,060,183	40,025,850	26,850,844

The companies which reported their production for September operate 224 of the countries 411 blast furnaces, and on Dec. 31 had 150 active, as against 134 on Nov. 30 and 119 on Oct. 31. These companies in December made 2,119,755 tons of pig iron, as compared with 1,784,452 tons in November and 1,478,217 tons in October. December was a 31-day month compared with the 30-day month of November.

Complete returns of pig iron production and blast furnace operations will appear in next week's issue of IRON TRADE REVIEW. Brief returns for the last three months, however, with December estimated, are as follows:

	*Dec	Nov.	Oct.
Total production, gross tons	2,940,000	2,514,979	2,461,727
Average daily production, gross tons	95,000	83,832	79,410
Furnaces operating last day of month	225	204	182

*Estimated from partial returns.

Fried. Krupp, Ltd. Seeks $10,000,000 Flotation

Fried. Krupp, Ltd., is floating a $10,000,000 7 per cent dollar note issue in this country, one of the first signs of German industry coming to America for funds under the Dawes plan. The Krupp works produces about 9,500,000 tons of coal annually, and its steel capacity reaches 2,200,000 tons per annum. Although Krupp products are most familiarly known as war materials, before 1914 but 5 per cent of its output was represented by munitions. Since 1919 the company has been exclusively engaged in production of industrial articles such as rails, locomotives, rolling stock, castings, motors, motor trucks, structural steel, agricultural implements, engines, cash registers, etc.

The obligations of the Krupp company with respect to payment under the Dawes plan, require the company to pay an amount not exceeding 6 per cent upon a capital sum which has not yet been definitely determined but which probably will not exceed $7,200,000. The purpose of the issue is to reduce the current indebtedness of the company and to assure adequate working capital for the future.

James T. McCleary Dies

James T. McCleary, secretary of the American Iron and Steel institute from Jan. 11, 1911 to May 1920, who died Dec. 17 at his home in LaCrosse, Wis., was for many years a congressman. He was born in Ingersoll, Ont., Feb. 5, 1853 and was educated in the common schools and McGill university, Montreal. He was elected to congress from the second district in Minnesota, continuing his public service for 14 years. He established himself as a predominating protectionist.

The Fort Dodge Culvert & Steel Co., Fort Dodge, Iowa, has installed a 3-high, 16-inch roughing mill of the Belgium type.

Campbell Predicts 1925 Will Be Prosperous

Youngstown, O., Dec. 30.—A very hopeful picture of the outlook for industrial business in 1925, is drawn by James A. Campbell, president of the Youngstown Sheet & Tube Co.

"Conditions at present are favorable for the steel business, as well as for business in other lines for the coming year. Most of the steel companies have contracts covering their output, at least of the more important products, during the first quarter. It should be understood, however, that these contracts are for the maximum requirements of the consumer, and form no assurance in themselves that all of the material covered by them will be specified and taken. It is my belief, however, that this tonnage will be generally taken during the first quarter, for the reason that prices at which these contracts were made are somewhat lower than those now prevailing.

"My reasons for expecting good business throughout the year are that the farmer now is receiving higher and more profitable prices for his products, than for several years; the railroads are, I believe, making more money than at any time in their history; the population is growing daily and must have additional houses to provide shelter, and commercial buildings of all kinds must be erected to keep pace with the progress of the country. These three factors being prosperous, will have the ability to finance increased purchases, and they all are important consumers of steel products.

"If we all keep our feet on the ground, and both capital and labor are satisfied with reasonable rewards, the coming year should be prosperous for business in all lines."

Jonathan Warner, president of the Trumbull Steel Co., Warren, O., also predicts a year of general prosperity and believes that the present volume of steel demand will increase.

AVERAGE DAILY PRODUCTION

	1924	1923	1922	1921	1920
Jan.	97,273	104,136	53,090	77,895	97,172
Feb.	105,987	106,925	58,220	68,906	102,904
Mar.	111,787	113,664	65,674	51,447	108,895
April	107,537	118,210	69,005	39,691	91,754
May	84,515	124,790	74,495	39,202	96,310
June	67,427	122,262	78,748	35,466	101,553
July	57,531	118,860	77,517	27,892	98,190
Aug.	60,741	111,254	58,408	30,802	101,468
Sept.	68,454	103,917	67,466	32,859	104,143
Oct.	79,410	101,375	84,827	39,821	106,075
Nov.	83,832	96,373	94,870	47,165	97,836
Dec.	95,000	93,952	99,468	52,992	87,105
Ave.	84,864	108,659	73,563	45,223	99,456

New plant of Fuller Brush Co., Hartford, Conn., Illustrating Developments in Beautifying Industrial Structures

1924 Industrial Building Drops

Caution and Hesitation in Expanding Capacities and General Dullness in Business Cut Heavily Into Industrial Construction—Year Ends With Upward Impetus—Much Heavier Volume Is Expected During 1925

BY ROBERT T. MASON

CURTAILED industrial operations, semidepression in many phases of manufacturing and a general hesitancy and caution in expansion, contributed in limiting industrial construction in 1924 to approximately 63 per cent of the volume recorded in the previous year. Actual awards of building construction placed in the 11-month period from Jan. 1 to Dec. 1 totaled 36,651,600 square feet as compared with 57,613,900 square feet during the same period of 1923. The number of new projects likewise showed a decrease from 3736 to 3134, according to figures compiled by F. W. Dodge Corp., New York, and representing projects definitely launched in the 27 northeastern states during 1924.

Considerable activity was noted in the first few months of 1924, but with the high point of the industrial year reached in March and April, building contracts began to become fewer, and awards of new projects slid off until the low point was recorded in July. In that month, awards of contracts for approximately 2,415,700 square feet of building were made, this being the lowest monthly total since August, 1921, when 2,291,000 square feet were awarded. The upturn started in August, 1924, and by the close of that year contracts were being booked at a much higher rate. The bookings in December, from early indications, should be higher than any month excepting March and April, when 4,225,100 and 4,488,200 square feet were booked.

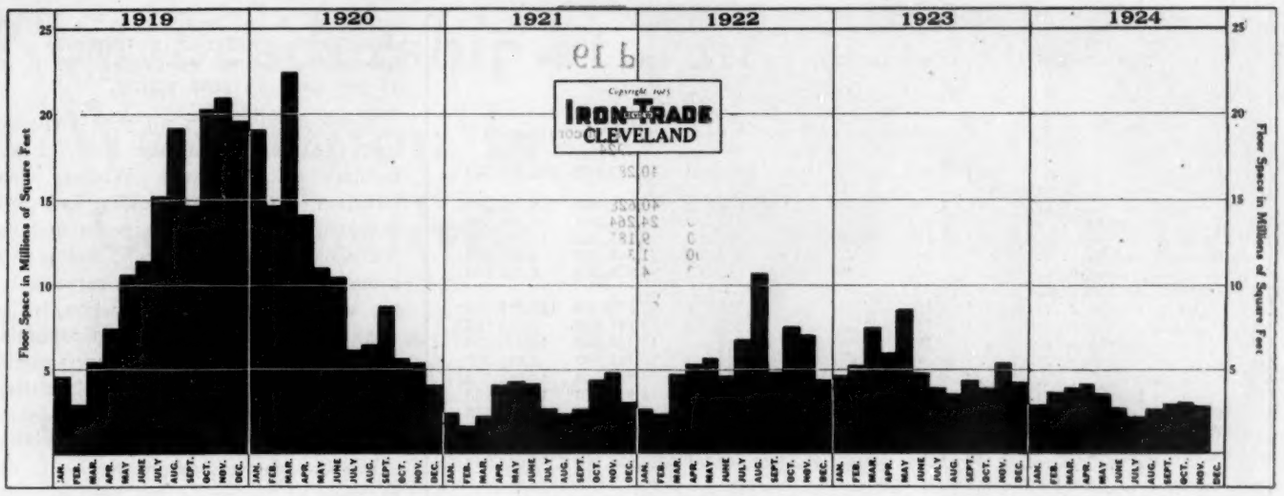
Metalworking construction showed one of the least drops among the 14 major industries, data on which appears in the accompanying tables. In 1924, 536 such projects definitely were launched as compared with 632 in the year preceding. The 1924 projects involved 8,451,100 square feet and involved $40,280,000 expenditure, compared with 12,343,400 square feet and an aggregate cost of $51,090,300 in 1923. One of the largest drops in work contracted in 1924 was in central heating and power plants. The number of projects of this nature decreased from 194 in 1923 to 105 in 1924. Expenditure involved in 1923 was $120,615,900 as compared with $94,813,000 in 1924, while 4,536,200 square feet were awarded in the former as compared with 1,358,600 square feet in the latter year.

Mining and quarrying activity fell from 197 projects launched in 1923 to 157 in 1924, with a correspondent decrease in square feet from 3,148,800 to 2,487,800, and a drop of investment outlay from $16,154,200 to $13,463,900. Among the other industries, food products decreased from 691 to 617 projects; textiles and cordage from 197 to 133, rubber working from 41 to 23, chemicals, paints, etc., from 139 to 118; leather working from 49 to 35; glass working from 28 to 22; paper and pulp mills from 85 to 63 and printing and binding from 146 to 125; and miscellaneous and unspecified, from 1105 to 948.

The only classification of industrial building to record an increase in 1924 over the preceding year was oil mills and refineries. These increased from 50 to 70 in number, but decreased from 845,300 to 486,500 in square feet in size. Invested capital decreased from $8,222,800 to $4,226,200, indicating a decrease in the size and expenditure of buildings in the oil industry.

Following is a table of the number of awards, floor space and cost for industrial construction in 1924, and monthly average from 1919 to 1923:

Year and month	No. of projects	Sq. ft. in thousands	Dollars in thousands
1919 monthly average	636	12,772	$ 42,744
1920 monthly average	511	10,652	49,080
1921 monthly average	274	2,981	14,444
1922 monthly average	323	5,463	27,084
1923 monthly average	338	5,184	31,568
January, 1924	234	3,029	19,723
February	262	3,786	17,057
March	298	4,225	19,437
April	339	4,488	54,181
May	289	3,754	20,213
June	254	2,891	19,026
July	234	2,415	14,475
August	253	2,702	23,865
September	298	3,199	30,025



TREND OF INDUSTRIAL CONSTRUCTION FOR SIX YEARS. CHART FIGURES FURNISHED BY F. W. DODGE CORP.

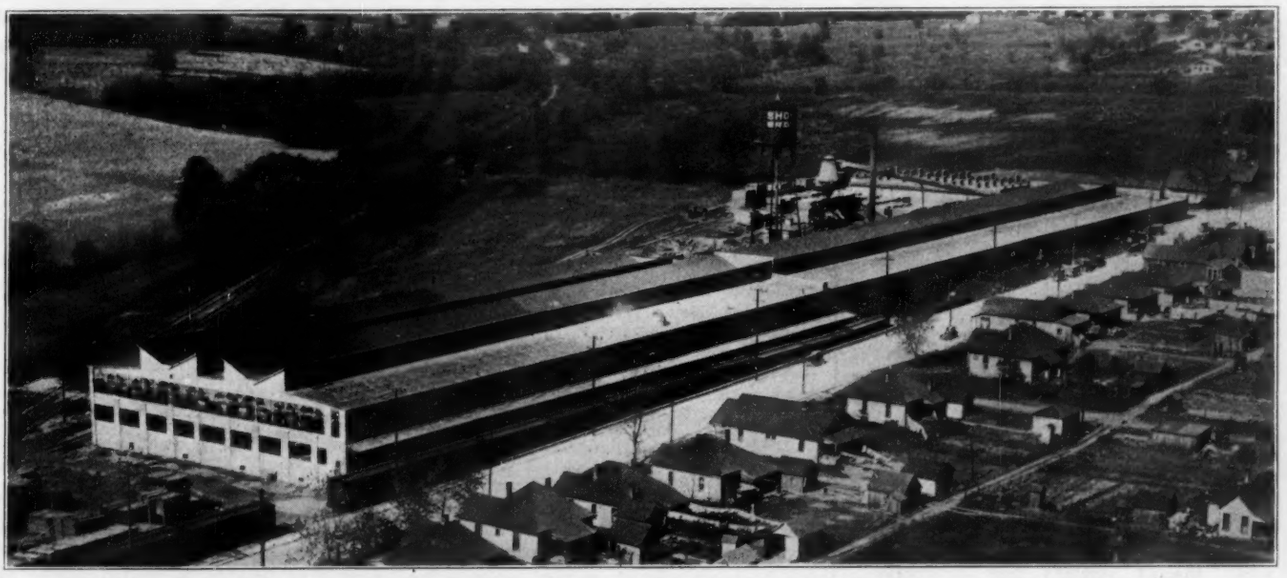
October	347	3,332	14,395
November	...	3,040	34,373
December	...	.....	.....
Total for 11 mos..	2,808*	36,861	$266,770

*Total for 10 months
Figures supplied by the F. W. Dodge Corp.

Decreased expenditures in buildings were more or less common in 1924 as was true in 1923, with emphasis being placed upon simplicity of design and efficiency of layout. "An unusual number of small additions were made to plants during 1924 which, due largely to the cautious manner in which manufacturers were approaching an expansion program," according to W. M. Brown, secretary of the H. K. Ferguson Co., Cleveland, engineer and builder.

Hesitation prevalent in all lines of industry in 1924 was one of the most dominant factors in the hindrance of industrial construction expansion in that year. Although the presidential elections might be granted as an excuse for delay and inaction, general business sentiment was far worse hit than actual business, and many lines of industry progressed rather than backslid. Overdevelopment in several preceding years and great uncertainty in respect to the immediate future was stated by one builder to be the cause of cutting down the volume of construction in 1924. Frank D. Chase, president of Frank D. Chase, Inc., Chicago, engineer and architect, states: "Aside from the abnormal expansion in a few industries, due to the war, industrial plants in this country have not expanded for a number of years and in the metalworking industries, where war-time expansion was seemingly excessive, plants are not in general in excess of the requirements."

Plant replacement did not play a prominent part in the volume of business in 1924. Obsolete buildings in many cases were used at a loss in efficiency rather than to brave the tide of pre-election pessimism and fear, and take definite steps for replacement. Economies in operation due to modern plant layouts will become one of the dominant factors in new construction, although, perhaps, not responsible for as great a program as new enterprises. Engineers and builders generally believe that with a normal resumption of industrial conditions there will be considerable plant replacement and modernization. One engineering company in Michigan stated that most of its work in 1924 was equipment layout and rearrangement of existing plants to effect the greatest economies from present structures. George V. Rhines, of Mills, Rhines, Bellman & Nordhoff, Toledo, O., architects, state that "there is a distinct demand for maximum economy in design and a tendency toward refinements along some lines, as for instance, better heat insulation in roof construction, caused by high cost of heating installations and ex-



AIRPLANE VIEW OF WORKS OF SHOWERS BROS. CO., EAST BLOOMINGTON, IND., FOR WHICH H. K. FERGUSON CO., CLEVELAND, WAS ENGINEER. STRAIGHT LINE PRODUCTION AND PLENTY OF EXPANSION ROOM FEATURE THE PLANT

Industrial Construction in 1923 and 1924

Figures Include Awards from Jan. 1 to Dec. 1

Industry	No. of projects 1924	1923	Square feet of floor space 1924	1923	Cost of construction 1924	1923
Metalworking	536	632	8,451,100	12,343,400	$40,280,000	$51,090,300
Miscellaneous unspecified	948	1,105	9,362,100	13,804,600	40,628,900	53,722,000
Food products	617	691	5,421,000	7,852,200	24,264,300	32,786,100
Textiles, cordage, etc.	133	197	2,295,300	3,213,200	9,185,100	13,063,700
Rubber working	23	41	276,300	579,600	1,365,500	1,888,800
Oil mills, refineries	70	50	486,500	845,300	4,226,200	8,222,800
Central heating and power plants	105	194	1,358,600	4,536,200	94,813,000	120,615,900
Chemicals, paints, etc.	118	139	1,368,300	1,212,200	5,781,200	4,518,700
Mining, quarrying, etc.	157	197	2,487,800	3,148,800	13,463,900	16,154,200
Leather working	35	49	627,100	720,800	2,342,500	2,869,000
Glass working	22	28	295,300	1,915,600	3,760,000	16,094,000
Paper and pulp mills	63	85	885,900	2,196,700	4,526,200	10,727,500
Printing and binding	125	146	1,473,300	2,939,300	7,267,200	16,971,900
Woodworking	182	182	1,863,000	2,306,100	6,182,500	6,965,300
Totals	3,134	3,736	36,651,600	57,613,900	$258,086,500	$355,690,200

Data supplied by the F. W. Dodge Corp.

pense of operating. This is a phase of plant expansion and will be a factor when such expansion occurs."

One development in certain types of manufacturing industries is the trend toward making industrial plants more architecturally beautiful, with grassed grounds, shrubbery, and other beautifiers, placing a premium on making the environment productive of the highest quality of effort on the part of their workmen. Such a plant, constructed during the past year, is that of the Fuller Brush Co., Hartford, Conn., which easily might be mistaken for a school or other public building by its physical attractiveness. Truscon Steel Co., Youngstown, O., did much of the work on the window sash and other details which placed a higher architectural tone on the completed structure.

Another trend in industrial construction is the establishment of plants in small towns, where shipping facilities are adequate but which offer cheaper and more permanent labor, better labor atmosphere, lower taxes, and more available and cheaper land for expansion. On this subject, the Ferguson company states, "In order to meet the demand for newer and better products and to sell them at a reasonable price, the manufacturers have had to provide themselves with better shipping facilities and lower production costs. This is being accomplished by moving their plants to the outlying districts of the larger cities and to smaller towns where land can be purchased more cheaply. In this way, the manufacturer not only lowers his fixed charges against his product, but his cost of manufacturing is decreased considerably because of straight line production." The accompanying illustration of the Showers Bros. Co., East Bloomington, Ind., is a definite illustration of the trend toward straight line production, with plants located in small towns.

Stability of labor and construction costs in 1924 was fairly general, few disturbances by the building trades unions marring the progress of work.

The cost of labor in some cases coupled with high material prices produced a depressed condition preventing development of any considerable building program.

In commenting on the labor situation, Mr. Brown of the Ferguson company states:

"The cost of building often is a deciding factor in influencing the manufacturer to locate in a certain territory, but it is interesting to note that in spite of the higher rates of wages during 1924, the actual cost of erecting industrial buildings has been less this year than in 1923. This has been due, in no small degree, to the larger available supply of labor this year, but which condition will not exist in 1925. There are some agreements now existing between builders and labor unions which will help to stabilize costs in some sections of the country, except for the arbitrary payment of bonuses by some owners who have delayed their building programs until the demand for their products has exceeded their productive capacity. The present year has been a very favorable one for the buyers of construction materials, as it has been a buyer's market. The prices of building materials will have advanced on an average of 10 to 15 per cent by next spring."

Development of an all year construction program is another goal of the builders and engineers. Whereas construction formerly previously had been seasonal, producing sharp peaks and depressions in labor, materials, and profits, a more stable and horizontal curve is being effected. Winter construction is being made more practical. Economics gained in building during a presumedly off period have enticed many industrial interests into carrying on plant expansion or new construction during the winter.

Herbert Hoover, secretary of the department of commerce, has been of great assistance to the building industry and owners, according to various builders. He has fostered a close study of the building situation and has disseminated information regarding evils of seasonal construction and how best to overcome them. The effect of builders co-operating with the department of commerce should in the future assist in straightening out the curve of construction for each year.

Prospects for 1925 building are unreservedly bright, a consensus of builders agreeing that a greater volume of work will be booked during 1925 than in 1924. Frank Chase states "I look to see an increase in industrial building operations during 1925 although this activity will not reach its maximum until about 1927." E. H. Temple Jr., general manager of the Aberthaw Co., Boston, construction engineer, states "The outlook for industrial enterprise in 1925 is extremely good. Our reason for this belief is in the optimistic turn which immediately followed the election. Lack of confidence in the future seems to have been the principal reason for slow industrial development, and with this removed, which is apparently the case, industrial development should pick up once more to a normal level."

Industrial Building Contemplated in 1923 and 1924

Figures Include Plans Projected from Jan. 1 to Dec. 1

Industry	No. of projects 1924	1923	Cost of construction 1924	1923
Metalworking	699	911	$56,233,200	$75,786,800
Miscellaneous unspecified	1,239	1,532	74,242,500	114,678,200
Food products	835	1,054	45,012,900	50,264,300
Textile, cordage, etc.	186	274	11,542,000	19,747,200
Rubber working	34	35	2,335,500	2,742,200
Oil mills, refineries	93	72	13,823,300	26,000,600
Central heating and power plants	144	382	77,322,800	264,378,700
Chemicals, paints, etc.	155	175	10,069,700	9,221,600
Mining, quarrying, etc.	226	287	27,327,900	39,858,700
Leather working	39	69	1,989,500	4,946,000
Glass working	29	30	3,547,000	8,114,000
Paper and pulp mills	83	114	5,060,200	22,008,500
Printing and binding	160	203	10,640,200	14,365,900
Woodworking	242	278	8,161,000	11,584,300
Totals	4,164	5,436	$347,507,700	$663,697,000

Data supplied by the F. W. Dodge Corp.

New Leadership at Washington Is Constructive

Blocs Are Much Less of a Factor in Government; Removal of Obstruction Indicates Real Progress—Economy Becomes Watchword—Administration Opposed to Unnecessary Interference with Business—Taxation and Freight Rate Problems To Be Worked Out

BY FRED. B. PLETCHER
Washington Correspondent, Iron Trade Review

AS EVENTS of the new year begin to unfold at Washington, evidences appear of amazing changes in the tint of the national political picture, hastened by happenings of the last few months. The congress that assembled on Capitol Hill Dec. 1 is the identical congress that adjourned last June after over-riding Presidential vetoes, blocking many of the administration measures, forming coalitions that rendered the majority party impotent, which stirred up a quagmire of investigations and kicked up a fuss generally.

This same congress, riding into the closing weeks of its existence, while in no position or mood to inaugurate new policies or explore new fields of legislation, is a changed congress. The psychological effects of the triumph of the administration party at the polls, plainly have been imprinted. Congress has been transformed into a more docile body. Nothing of the entirely helpless nature is noted about the Republicans in either house any longer, despite the fact that the La-Follette bloc, by joining the Democrats, holds at least a technical balance of power. This change is a forerunner of the new sixty-ninth congress to assemble a year hence.

The present or "short" session of congress can do little more in the remaining eight weeks before its natural expiration than pass the necessary appropriation bills to carry forward the normal work of the executive departments in the ensuing fiscal year. It will have served its purpose if it accomplishes this and little else. All legislation pending when congress took an abrupt adjournment last June for the political conventions remained over on the calendars for the short session. The opening weeks brought a flood of new bills into the mill, and others were reported from committees. But most of the measures, new and pending, were far too controversial in their nature to give any assurance that they would be given kindly consideration in this session, and the great majority of them never will see the dawn of a statutory day in the sixty-eighth congress.

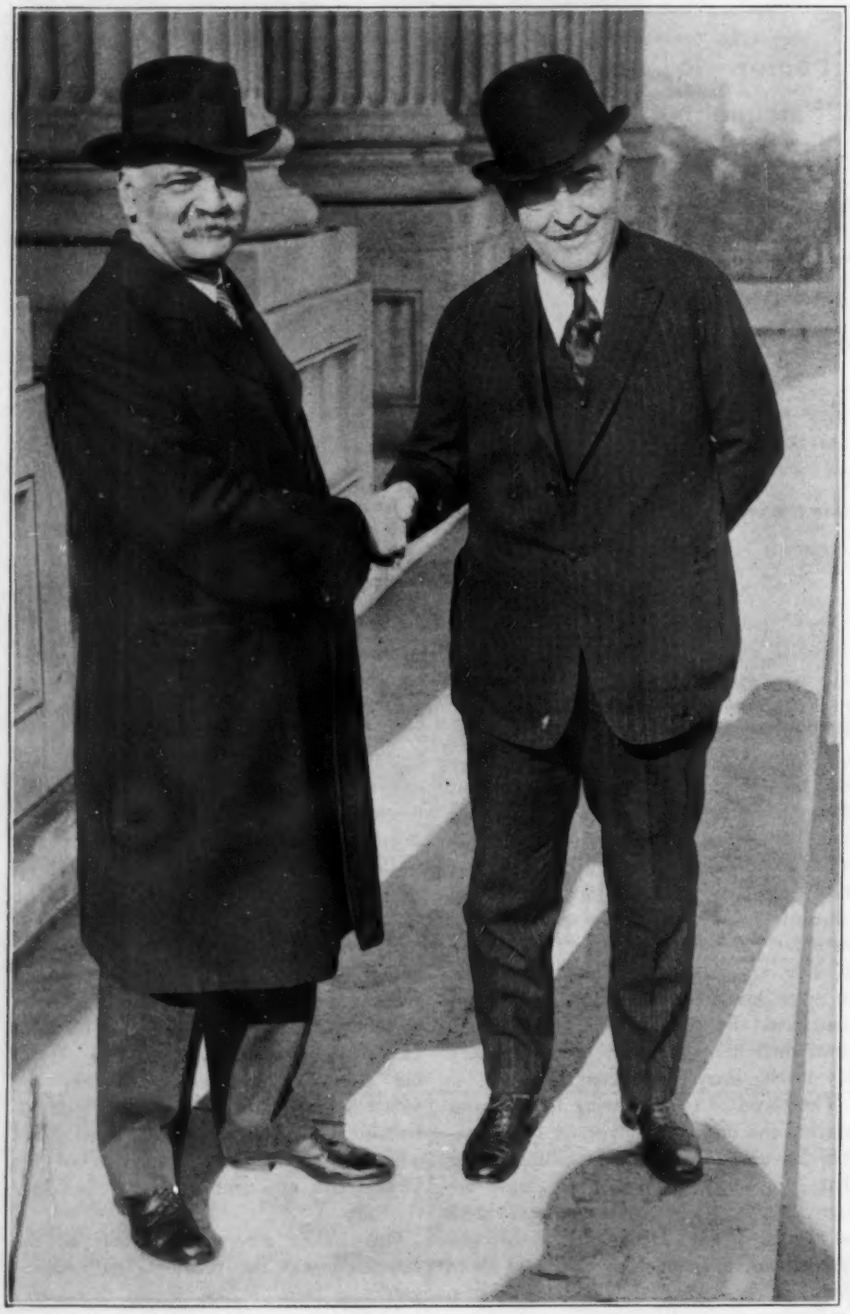
The claws of the left-wing Republicans, bearing the unsavory flavor of LaFolleteism, have been clipped, notwithstanding that 10 months or more may elapse before the newly elected congress shall be seated. The Democrats show less disposition to form bloc coalitions with their former insurgent allies. Such men as Senator Smith W. Brookhart, of Iowa, who called themselves Republicans but who were borers within the party, returned to the Republican cloakrooms sadder but wiser men. Winning back his seat in the senate by the narrow margin of about 755 votes out of 1,000,000 cast, Brookhart in the next session must face an election contest in the upper house started by his opponent in Iowa, Daniel J. Steck, a Democrat. The latter will have the support of conservative Republican senators, including Senator Reed Smoot, of Utah, a Republican of the old school.

Magnus Johnson, the Farmer-Labor senator from Minnesota, is making his farewell appearance. His opponent, Representative Thomas D. Schall, of the tenth district of Minnesota, has been elected to the senate at the expense of Mr. Johnson. While having been a supporter of railroad brotherhood measures, Schall is not of the radical type of Johnson, and Democrats in Minnesota supported Schall to defeat the Farmer-Laborite. Johnson, however, will contest the election. Another contest in the senate will be that of Senator Holm O. Bursum, of New Mexico, Republican, who has challenged the election of his Democratic opponent at the polls, Sam G Bratton.

Outstanding among the events of the campaign was the readiness with which voters in many states aligned themselves in opposition to the attempted sweep of radical sentiment, even to the extent of supporting candidates of opposite political faith when it appeared necessary. Senators LaFollette, Brookhart, Lynn Frazier and Edwin F. Ladd, the latter two from North Dakota, have been read out of the party councils and shorn of important committee assignments to the surprise even of regular Republicans. This, of course, fanned some of the radi-

cal embers of discord, but to LaFollette it meant only another hour to enjoy his place in the sun of public notice. The radicals in the senate and house are seeking to exert what power they may command in the few remaining weeks that any tangible sign of strength can be mustered.

The November elections also demonstrated again the futility of assurance on the part of anyone to 'deliver" the so-called organized labor vote. The newly elected congress need have no apprehension concerning organized labor, nor fear the snap of the fingers of leaders of the American Federation of Labor. Union labor voted independently. Of the 13 new members elected to the senate of the sixty-ninth congress, three are industrial leaders, one an engineer, and Senator-elect W. H. McMaster, of South Dakota, is a banker. Some fear is even expressed by political observers that the sweeping victory of the administration at the polls may lead to stand-patism, which, it is regarded, would do more to develop an active third party movement for 1928 than a vast volume of soap-box oratory.



SENATOR CHARLES CURTIS, of Kansas, was brought up on an Indian reservation near Topeka, Kans., being one-fourth Kaw Indian. Later he was a race horse jockey in Kansas City and elsewhere, and he studied law while driving a hack in Topeka. He won a reputation as a lawyer and 31 years ago he was elected to the house of representatives, and 14 years later to the senate. He now is Republican leader of the senate, taking the place left vacant by the death of Henry Cabot Lodge, of Massachusetts.

William M. Butler, of Massachusetts, who piloted the Coolidge campaign to victory as head of the Republican national committee, was appointed to the senate to fill the place of Senator Lodge. Butler has much of the Coolidge taciturnity—a typical New Englander.

Economy has been the outstanding word in the lexicon of the administration. Never before in the history of the country has such stringent and extensive economy been practiced in governmental operations. In his message to congress President Coolidge declared that the government can do more to remedy the economic ills of the people by a system of rigid economy in public expenditure than can be accomplished through any other saving. Pointing out that the costs of national and local government combined are nearly $100 for each citizen, President Coolidge declared that economy reaches everywhere and carries a blessing to everybody.

So rigid has been the economy system under the national budget that many of the government departments have been smarting under the cuts. New plans have been made to carry on governmental functions on a revised scale. Printing appropriations in the bureau of foreign and domestic commerce, for instance, have been kept down to such an extent that all of its valuable publications have been reduced greatly in size, making necessary the elimination of a large amount of statistical information on exports and imports of raw materials and manufactured articles, which heretofore had been made easily available to business and industry. This particular cut is regarded as false economy, however, and it is believed that the condition soon may be remedied.

Much has been said about the possibility of President Coolidge asserting a more aggressive leadership, particularly with congress. It is strangely true that much of President Coolidge's personality still is not understood by a large number of the people. He displayed qualities of leadership as governor of Massachusetts, which, due to his position before election, he was unable to perform in the early incumbency of his office. With the hearty electoral support that was given him, it is indicated he is asserting a more persuasive leadership. Even in a democracy, executive pressure is something of a substantial influence. Coolidge is sympathetic with the industry of the country, and a firm believer in the ultimate evolution of the right principles of progress with a minimum of interference on the part of government.

One of the most vital subjects before congress has been taxes. The national taxes

amount to $27 for each citizen, despite the fact the republic's tax burden has been cut almost in two since 1921. Establishment of the most drastic national economy through the budget system has helped to pay off about one-fifth of the national debt since 1919. It remains at more than $21,000,000,000.

Indications are that after the March 15 taxes are paid, a large surplus will be shown, making the prospects of further tax reduction encouraging. It has been planned by some of the leaders in the senate to seek repeal of the gift tax and a further reduction of the inheritance taxes. Reduction of surtaxes also was to be sought to the levels recommended in the Mellon plan last year. Early in the session, however, the program was regarded as too extensive to permit of possible enactment at this session.

President Coolidge does not favor the calling of an extra session after March 4 to consider tax reduction unless imperative need is shown. Indications are there will be no extra session, unless one is called early in the autumn this year to give the new congress a few months' start over the regular session in December. Tax reduction next session likely would mean retroactive benefits on taxes paid this year.

Of equal importance has been the subject of freight rates. The interstate commerce commission has failed to undertake a general investigation of freight rates during the past year because of the possible effect of such action upon the unsettlement of business conditions. The commission holds that progress toward standardization of rates can be accomplished with more effectiveness through individual cases and investigations dealing with particular rate territories or adjustments.

It is pointed out that the commission now has before it about 1300 formal complaints that certain rate situations are unreasonable. In many of these cases, the complainants are interested primarily in the relationship of their rates to those of their competitors.

Revision of the short haul rates on iron and steel products is to be asked in a number of cases. Freight rates have become a particularly vital question to the industry since recent readjustments in methods of price quotations in the markets. It has been stated that under former conditions, there was no incentive for the Pittsburgh producers of steel to depress the Pittsburgh rate, but that there was an incentive to hold to a minimum the freight rate from producing points other than Pittsburgh.

The viewpoint of the commerce commission is that a gradual process of readjustment of rates is much more suited to the needs of commerce than are radical changes, which would involve more or less disturbance of business conditions. Many complaints of discrimination in freight rates have arisen through lack of standard class and commodity rate scales and through the extensive use by the railroads of commodity rates designed to meet the needs of their respective lines and shippers with little regard to the general adjustment in contiguous territories or the effect upon other roads and shippers. The commission hopes that the process of standardizing class rate percentages will aid in developing more uniform rates.

The commerce commission is charged with the responsibility of helping to establish a return of 5¾ per cent upon "fair value" of the roads. This return is not being obtained by the roads despite increased economies in operation.

The railroads claim that the saving to the shipping public due to decreased freight charges brought about by them amounted to $657,000,000 in 1923, as compared with the rates in effect in 1921. Since 1921, which marked the peak in freight rates, there has been a saving to the public because of reduced freight rates of about $1,373,000,000, the American Railway association declares. Enactment of the Hoch-Smith resolution in congress asking for a general revision of the freight rate structure will have no effect upon freight rate legislation this winter. More extensive revision in the rate structure naturally will come, however. Industrial shippers are going to oppose the movement that has been started for a general revision downward of the rates on farm products at the expense of the some of the rates on industrial products.

The railroads have no fear of unfavorable legislation at this session of congress. Early in the session it was seen that the fate of the Howell-Barkley bill was dubious. Some of the backers of this measure had lost zest in promoting it. The bill sought to do away with the railroad labor board and to lay upon all carriers, its officers, agents and employes an arbitrary system of four boards, two of which would have 14 representatives each and two more having six members each. The members were to be appointed from each group of management and employes with nominations of the labor group confined in each instance to members of nationally organized labor crafts classified in each group.

A year ago, the soft coal and the immigration problems were questions of national economic interest. The signing of the three-year wage and working agreement at Jacksonville, Fla., last February by the unionized coal miners and the operators of the central bituminous coal fields, which was engineered by Secretary of Commerce Herbert Hoover, has done much to stabilize this industry. Enactment of the 2 per cent selective immigration law, establishing a basic quota limitation of 2 per cent of the nationals of foreign birth in the United States in 1890, but making provision for a change in 1927, has gone a long way in regulating the American problem of assimilating the immigrants that come to the United States.

Secretary of Labor James J. Davis has recommended the extension of immi-

SENATOR WILLIAM EDGAR BORAH, of Idaho, was first elected senator in January, 1907. Prominently mentioned for the vice presidency in 1924, but turned down the nomination. He also became head of the foreign relations committee as the result of the death of Senator Lodge. He has been a bitter anti-League of Nations advocate. The foreign relations committee is one of the most important committees of the senate.

gration quotas to apply to Canada and Mexico as well as the quota countries in Europe and elsewhere. There has been a strong increase in the immigration from Canada and Latin-American countries since the enactment of the 2 per cent law. As a means of providing for the needs of American industry as respects labor supply, Secretary Davis has recommended to congress a provision for the admission of additional farmers and skilled or unskilled laborers where needed.

Secretary Davis also has recommended to congress the creation of a division of labor safety looking to more uniformity in state legislation along accident-prevention lines and in the gathering and compilation of accident statistics.

The coal problem which threatened to become one of national importance and which threatened to inject itself even into the political campaign has become less troublesome. The elimination of high cost mines which can operate only at certain times is bringing about more concentration of labor upon a smaller number of mines, the increase of days of employment throughout the year and thus a larger annual return. Secretary Hoover recently pointed out that the past year shows a saving in coal costs as compared with 1920 of about $1,000,000,000 to consumers, which must be reflected in decreased costs in many lines. The soft coal market, however, is said to be gaining greater production and trade in the nonunion fields of Kentucky and West Virginia than in the strongly unionized central competitive field.

Business in the past year has felt little governmental interference. The cease-and-desist order issued by the federal trade commission on July 21 against the United States Steel Corp. and subsidiaries ordering the elimination of Pittsburgh plus in market quotations on steel was an outstanding action. This case cost the government nearly $89,000,000 to prosecute.

Testimony is being resumed by the federal trade commission in the attack on the Bethlehem-Lackawanna steel merger, in which the charge is made that the acquisition by the Bethlehem company of the Lackawanna Steel Co. properties in October, 1922, tended to lessen potential and actual competition. This case is expected to drag out many months.

The United States shipping board and many in congress still are going ahead on the shipping problem with the obscure hope that somehow the country may emerge from the present shipping tangle under prolonged government operation of the merchant marine. Government operation represents a loss of the taxpayers of about $40,000,000 yearly. More and more sentiment has been growing in favor of the disappearance of the shipping board as a fleet operator, and it is argued that the board can accomplish its greatest service for American shipping by working for private ownership now. The President in his message urged a reorganization of the board.

The certification of vessels under section 28 of the merchant marine act by the shipping board during the year, which would have established preferential rates on commodities shipped for export and import in American bottoms, was fought vigorously by exporters. Action under section 28 undoubtedly will be suspended for some time.

Bills proposing reorganization of the 129 departments, bureaus and divisions of the government under which it was planned to regroup all these government activities, have been reported from the special joint congressional commission. Congress likely will complete action on these measures soon. This program, it is estimated, will effect a saving of $50,000,000 to $100,000,000 yearly.

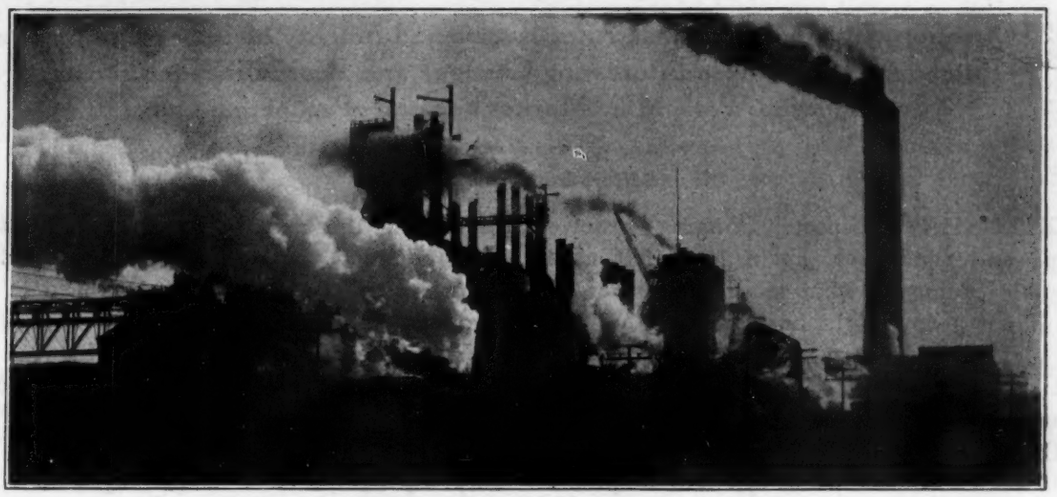
While considerable tariff discussion is bobbing up in this session of congress no action on revisions or as to the opening up of the tariff question can develop in this session. It would be clearly impossible for any agitation to carry out revision plans now. It is doubtful also whether much can be done in the next session.

Achievements of the simplified practice division of the department of commerce in the widespread campaign inaugurated by Secretary Hoover for the

(Concluded on Page 117)

T COLEMAN DU PONT, native of Louisville, Ky., 61 years old, has engaged extensively in coal and iron mining in Kentucky and in the construction and management of street railways for the past 20 years.

Thomas David Schall (upper photo) represented the tenth Minnesota district in the house 10 years. He defeated Magnus Johnson, Farmer-Laborite for the senate. At the age of 30 he lost his sight from electric shock.



River blast furnace plant of the McKinney Steel Co., Cleveland, in action

Domestic Market Reviews for 1924

Pig Iron	Ferroalloys
Coke	Structural Shapes
Semifinished Steel	Rails
Tin Plate	Sheets
Cast Iron Pipe	Plates
Merchant Bars	Nonferrous Metals
Welded Pipe	Old Material
Wire Products	Coal By-Products

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New Faith Redeems Dull Year

1925 Opening with Bright Promise After Restrained Activity of 1924—Elimination of Pittsburgh Plus Raises Interesting Changes and Possibilities—Railroads and Building Work Main Market Factors—Production Falls Off

BY C. J. STARK
Editor, Iron Trade Review

BRIGHTENING prospects, bringing renewed hope and confidence, again have left a favorable ending to what may be considered a sluggish if not a downright unsatisfactory year for the iron and steel industry. Similar circumstances modified only as to degree, have ushered in the market of the new year on three consecutive occasions. One of these years, 1923, developed into a successful period for the industry, both in production and profits. This showing, however, 1924 was not able to duplicate. How far the record-breaking production of 1923 put a check upon industrial operations of the past year, may not be appraised. That it had some effect admits of no doubt. The behavior of the pig iron market clearly illustrated this fact. Then there is the common version of the presidential year as a business factor to be given such weight as may be warranted.

Summarized comparatively, none of the past three years has been inaugurated under such conditions of common faith and optimism as 1925. If it is too much to call the outlook brilliant, at least it may be termed the most wholesome and encouraging since the war.

Records established 1924 as about a 60 per cent year whereas 1923 was fully 15 to 20 per cent better. The chart of the past year shows fluctuations paralleling those of its predecessor. Readjustment of production, however, was accomplished much more speedily. After demand slipped in March, 1924, required only four months to bring output to a point where recovery followed. In 1923 the cycle from reaction to revival spanned a period of seven months.

The year 1924 long will be known in market history as the time of the passing of Pittsburgh as the dominant basing point for steel prices. No more sweeping revision of established commercial practice has fallen within the experience of the present generation of buyers and sellers of steel than that precipitated through the acceptance Sept. 21 by the Steel corporation of the cease-and-desist order of the federal trade commission. That the numerous readjustments necessitated by the new order will have a pronounced effect upon future market and distributive conditions, is certain. Just what form these will take, will not be known finally until the industry has passed through at least one market depression and a period of vigorous competition. The net result so far observed has been to give buyers in favored locations lower prices by $2 to $3 per ton due to new basing points being established in sheets, tubular products, wire products, tin plate, strip and certain other lines.

Market Volume Fails To Reach Expectations

RAILROADS and the building industry furnished the backbone of the demand for steel in 1924. Probably orders for 8,000,000 to 10,000,000 tons of rolled material could be attributed to these sources. The railroads were the outstanding customer of the mills. They bought steadily if not consistently. They placed approximately 135,000 cars or more than 30,000 greater than 1923. About one-half of this total was placed during the first three months. In March over 41,000 cars were placed. While car orders showed a healthy gain, motive power additions did not keep pace. Locomotive orders in the year are estimated at about 1100 compared with 2000 in 1923.

Rails made only a fair showing both in production and new orders. Virtually, all orders were cleaned up by July 1. Buying for 1925 began in earnest in August and kept up to the year-end. The mills start the year with well over 1,000,000 tons on their books and buying going on vigorously.

Building steel requirements kept up their high gait of the previous year and scored a new record with awards aggregating in excess of 2,000,000 tons. The strength of the situation lay in the well-sustained volume of contracting from month to month. The railroads were liberal buyers of bridge work, placing single lots up to 25,000 tons.

The automotive industry did not require as much tonnage as in the previous year and followed a conservative policy especially during the second half. The agricultural implement business in 1924 worked further out of its prolonged depression and with the marked improvement in the condition of the farming industry, now faces the best prospects in several years.

Three market movements of major character fell within the year. Under the force of expanding demand, production and prices rose in January,

February and March. The four months of rapid decline that followed were succeeded by a moderate recovery in September, October and November. This blossomed out into a genuine buying movement in November after the national election had taken place. At this stage heavy purchases of both pig iron and steel were made up to March and April. As the year closed, the evidences that consumption was experiencing a healthy increase were more numerous and trustworthy.

interesting phase of this active buying of in November was the reduced amount of future contracting on an optional basis which in the past had made the market position of the industry so problematical and insecure. Throughout the year buyers had manifested an unwillingness or indifference toward obligating themselves very far into the future. They counted on the large productive capacity and the speedy deliveries assured by efficient railroad transportation. When they returned to the market in November they found the mills less disposed to place contracts. As a result, in large part, actual orders were placed or definite delivery dates specified.

Prices in all lines ended the year on a considerably lower plane than they began it and generally showed a downward trend. The two extremes, high and low, respectively, were March and October. The spread between these two points was $3 to $5 per ton in pig iron and $5 to $12 per ton in finished steel. This was exactly the reverse from the preceding year, when finished steel held throughout the year while pig iron was dropping $8 to $10 per ton. Compared with Jan. 1, 1924, mill material at the start of the new year is $3 per ton lower in steel bars; $12 lower in steel plates; $10 lower in structural shapes; $5 lower in black and blue annealed sheets; $7 lower in galvanized sheets; $3 lower in plain wire and wire nails; $17 lower in cold-rolled strip; $12 lower in hot-rolled strip; $10 lower in hoops; and $8 lower in bands. Tin plate has remained unchanged.

The pig iron market had a bad year. While the downward swing of prices which marked most of 1924 was not as deep as in the preceding 12 months, it carried an already depressed market $2 to $3 lower before a revival came in October. The general average of pig iron prices in 1924 was the lowest since the war period or since 1915. One great burdening factor that kept the iron market in the eclipse was the great total of unshipped iron on furnace yards. More than 1,000,000 tons of iron for sale, an extraordinary amount, was on hand Jan. 1. This accumulation took place largely during 1923 when production was continued at a high record clip long after conditions warranted it. By June this total had increased further to approximately 1,250,000 tons, the largest figure known since comprehensive statistics were compiled in recent years. Severe curtailment of output and increasing shipments have brought this down to less than 1,000,000 tons in December. The heavy buying movement in late October and November accounting for more than 1,250,000 tons put melters well under cover to April 1. Some companies reported sales the most vigorous since 1920. This lifted prices $2 to $3 per ton.

IRON TRADE REVIEW weekly composite of 14 leading iron and steel products clearly traced the price curve of the general market during the year. The index rose during the first two months, averaging $43.26 in January and $43.49 in February, the peak. Nine months of decline then followed. March showed an average of $43.24; April of $42.33; May of $41.38; June of $40.61; July of $39.78; August of $39.33; September of $39.05; October of $38.65 and November of $39.00. This slump was broken by the first advance in November. Five weeks rise had brought the composite to $39.94 by mid-December.

Production Has Swiftest Shrinkage in History

IN PRODUCTION, 1924 was not important. With two exceptions, the great depression period of 1921 and the year that followed, it showed the lowest total in both pig iron and steel ingots since 1915. Starting the year on an upward wave, output reached its crest in March. It then abruptly receded and by July had touched a point where recovery again was in order. The decline from March to July was exceedingly precipitate. In pig iron it amounted to over 57 per cent and in steel ingots to about 55 per cent. Only 145 blast furnaces were running in July as against 269 in March.

It is doubtful whether the American iron and steel industry ever has witnessed so swift a reaction, from start to finish, as in this period. The sheer fall of production and the rapidity with which the cycle was traversed, undoubtedly was a material factor in making an early revival possible. From July forward a steady advance developed which is still in motion. By November pig iron was back to 75 per cent of the March figure with 204 furnaces in blast and steel ingots had been restored to 77.5 per cent.

Pig iron production in 1924, both coke and anthracite, is estimated at approximately 31,100,000 tons, a loss of over 9,000,000 tons or about 22 per cent from 1923. Probably 37,750,000 tons of steel ingots and castings was made in the year, which is more than 7,000,000 tons or 16 per cent below 1924.

Domestic Iron and Steel Prices in 1924

Average Monthly Prices of Leading Materials at Pittsburgh

PIG IRON

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bessemer	$24.66	$25.01	$24.86	$24.61	$24.06	$23.26	$21.66	$21.76	$21.76	$21.76	$22.11	$23.26
Basic	23.16	23.76	23.76	23.46	22.46	21.76	20.76	20.76	20.76	20.76	21.01	22.26
Foundry No. 2	24.16	24.76	24.26	23.51	22.66	21.26	20.76	21.01	21.26	21.26	21.36	22.26
Malleable	23.76	24.76	24.26	23.96	23.06	21.51	20.76	20.76	21.26	21.26	21.01	22.26
Gray Forge	23.56	24.61	24.26	23.51	23.26	20.76	20.26	20.51	20.76	20.76	20.76	21.76
Bessemer Ferrosilicon 10 per cent	21.50	42.50	42.25	41.50	40.30	39.50	39.50	30.50	39.50	39.50	39.50	39.50

SEMIFINISHED

Billets, Bessemer	$40.00	$40.00	$40.00	$40.00	$39.20	$38.00	$38.00	$38.00	$37.10	$36.60	$35.50	$35.50
Billets, Open Hearth	40.00	40.00	40.00	40.00	39.20	38.00	38.00	38.00	37.10	36.60	35.50	35.50
Sheet Bars, Bessemer	42 50	42.50	42.50	42.10	40.60	40.00	39.20	38.00	37.50	37.20	37.00	37.00
Sheet Bars, Open Hearth	42.50	42.50	42.50	42.10	40.60	40.00	39.20	38.00	37.50	37.20	37.00	37.00
Wire Rods	51.00	51.00	51.00	51.00	48.40	48.00	48.00	46.00	45.75	45.00	45.50	48.00

COKE

Furnace, Spot	$3.80	$4.00	$4.05	$3.55	$3.35	$3.15	$2.85	$3.00	$3.00	$3.00	$3.00	$3.35
Foundry, Spot	4.35	4.80	4.85	4.60	4.30	4.15	4.05	4.00	4.00	4.00	4.05	4.25

ROLLED PRODUCTS

Structural Shapes	2.50c	2.50c	2.50c	2.35c	2.25c	2.20c	2.15c	2.05c	2.00c	2.00c	2.00c	2.00c
Plates, base	2.50c	2.45c	2.40c	2.35c	2.25c	2.15c	2.10c	2.00c	1.95c	1.80c	1.85c	1.90c
Steel Bars, base	2.40c	2.40c	2.40c	2.30c	2.25c	2.20c	2.15c	2.10c	2.05c	2.00c	2.05c	2.10c
Cold Finished Steel Bars	3.00c	3.00c	3.00c	3.00c	3.00c	2.90c	2.85c	2.80c	2.75c	2.70c	2.70c	2.80c
Strip, Hot Rolled, base	3.00c	2.95c	2.85c	2.75c	2.60c	2.55c	2.60c	2.50c	2.45c	2.35c	2.25c	....
Strip, Cold Rolled, base	5.00c	4.80c	4.80c	4.75c	4.50c	4.50c	4.35c	4.20c	4.00c	4.00c	4.00c	4.15c
Steel Pipe, ½ to 3-inch, discount	62	62	62	62	62	62	62	62	62	62	62	62
Standard Spikes, base	3.05c	3.05c	3.05c	3.00c	2.95c	2.90c	2.80c	2.80c	2.75c	2.70c	2.75c	2.80c
Wire Nails, base	3.00c	3.00c	3.00c	3.00c	2.95c	2.90c	2.85c	2.85c	2.80c	2.75c	2.75c	2.85c
Plain Wire, base	2.75c	2.75c	2.75c	2.75c	2.70c	2.65c	2.60c	2.60c	2.55c	2.50c	2.50c	2.60c
Hoops, base	3.00c	3.00c	2.85c	2.75c	2.75c	2.70c	2.60c	2.60c	2.55c	2.50c	2.50c	2.50c
Bands, base	3.00c	3.00c	2.85c	2.75c	2.75c	2.70c	2.60c	2.60c	2.40c	2.40c	2.40c	2.40c
Structural Rivets, base	2.85c	2.75c	2.75c	2.65c	2.60c	2.55c	2.50c	2.50c	2.55c	2.60c	2.60c	2.60c
No. 28 Black Sheets	3.75c	3.75c	3.75c	3.70c	3.65c	3.65c	3.60c	3.50c	3.45c	3.40c	3.45c	3.50c
No. 10 Blue Annealed	2.95c	2.90c	2.95c	2.80c	2.80c	2.80c	2.75c	2.70c	2.70c	2.60c	2.60c	2.70c
No. 28 Galvanized Sheets	4.95c	4.90c	4.90c	4.85c	4.80c	4.80c	4.70c	4.60c	4.60c	4.60c	4.60c	4.60c
Tin Plate, base box	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50

OLD MATERIAL

Heavy Melting Steel	$21.10	$21.60	$19.75	$16.60	$15.40	$16.25	$17.30	$17.75	$18.60	$18.40	$19.85	$21.00
Low Phosphorus	23.90	24.25	23.75	20.60	19.30	21.40	21.70	22.00	22.25	22.30	23.50	25.00
No. 1 Cast	21.30	20.85	19.60	18.35	17.50	17.75	17.70	18.00	18.35	17.70	18.25	18.50

Average Monthly Prices of Leading Materials at Chicago

PIG IRON

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lake Superior Charcoal	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04
Northern No. 2 Foundry	23.70	24.40	24.50	24.40	22.80	21.40	19.80	20.40	20.50	20.50	21.00	22.00
Southern No. 2 Foundry	27.61	29.01	28.88	28.15	27.41	26.01	24.01	23.89	23.51	23.51	23.76	25.76
Malleable	23.70	24.40	24.50	24.40	22.80	21.40	19.80	20.40	20.50	20.50	21.00	22.00

ROLLED PRODUCTS

Bar Iron, base	2.40c	2.40c	2.40c	2.35c	2.30c	2.25c	2.20c	2.15c	2.15c	2.10c	2.10c	2.00c
Rail steel bars, base	2.30c	2.30c	2.30c	2.20c	2.15c	2.10c	2.05c	2.05c	2.05c	2.00c	2.05c	2.00c
Steel bars, base	2.50c	2.50c	2.50c	2.40c	2.35c	2.25c	2.20c	2.15c	2.05c	2.00c	2.05c	2.10c
Structural shapes, base	2.60c	2.60c	2.60c	2.50c	2.45c	2.40c	2.25c	2.15c	2.10c	2.00c	2.15c	2.20c
Plates, base	2.60c	2.60c	2.60c	2.50c	2.45c	2.40c	2.25c	2.15c	2.10c	2.00c	2.15c	2.20c
Sheets No. 28 black base	4.09c	4.09c	4.09c	4.09c	4.09c	4.09c	3.99c	3.84c	3.75c	3.65c	3.65c	3.75c

OLD MATERIAL

Heavy melting steel	$17.40	$18.00	$16.70	$14.65	$13.75	$13.55	$14.75	$15.40	$16.40	$16.25	$17.05	$18.55
No. 1 railroad wrought	17.50	17.50	16.05	14.80	13.60	13.25	14.80	15.75	16.70	15.95	17.10	18.75
Rails for rolling	18.50	20.00	19.30	17.10	15.30	14.55	15.50	16.00	17.40	17.20	18.20	19.50
Car wheels	20.60	21.25	19.90	17.50	16.60	15.65	16.40	16.90	18.40	17.90	18.40	19.50
No. 1 cast	22.10	22.25	20.80	20.00	19.00	17.75	18.60	19.00	20.25	19.20	19.25	20.75

Average Monthly Prices of Leading Materials in the East

PIG IRON

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Basic, Eastern Pennsylvania	$22.50	$22.50	$21.50	$21.35	$20.75	$20.60	$20.50	$20.00	$20.00	$20.00	$21.46	$22.50
No. 2X Foundry, Philadelphia	24.26	24.26	24.13	23.73	22.60	21.76	21.76	21.76	21.26	21.36	22.98	24.88
No. 2X Virginia, furnace	25.00	25.75	26.00	25.50	25.50	25.50	24.50	24.50	24.50	24.50	24.50	25.00
*Standard Low Phosphorus, Phila	27.76	27.76	26.76	26.86	27.26	27.26	27.26	26.26	26.26	26.26	26.76	29.79
Standard Gray Forge, Eastern Pa	22.50	22.50	22.00	21.90	21.25	21.00	21.00	20.75	20.50	20.50	21.38	23.00

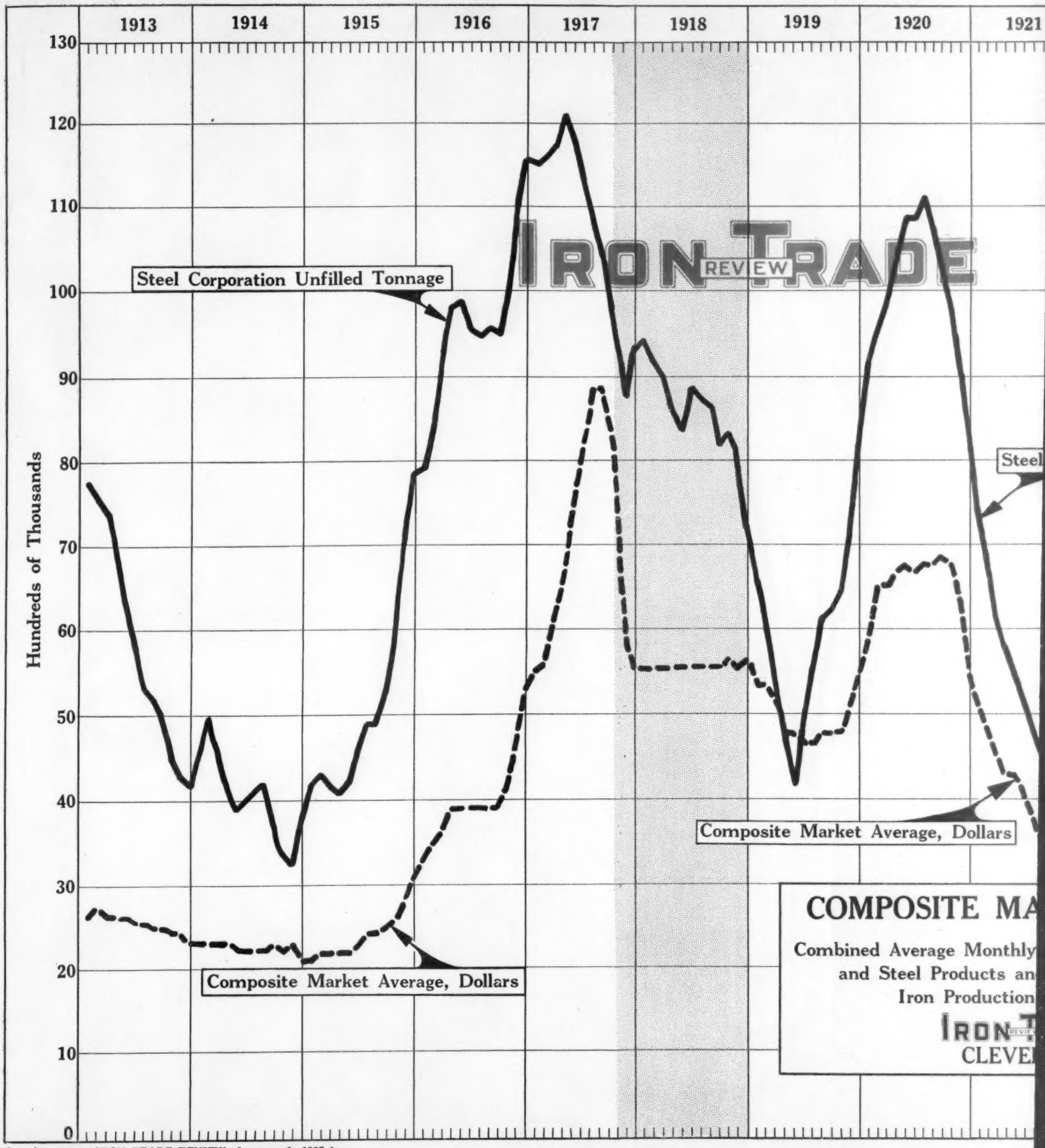
ROLLED PRODUCTS

Tank Plates base, Philadelphia	2.72c	2.62c	2.57c	2.52c	2.42c	2.27c	2.17c	2.07c	1.97c	1.92c	2.02c	2.22c
Structural Shapes, base, Phila	2.72c	2.67c	2.62c	2.57c	2.42c	2.42c	2.37c	2.32c	2.22c	2.12c	2.12c	2.22c
Steel Bars, Base Philadelphia	2.72c	2.72c	2.67c	2.57c	2.57c	2.52c	2.47c	2.47c	2.37c	2.32c	2.295	2.32c
Bar Iron, common base, Phila	2.57c	2.57c	2.57c	2.47c	2.47c	2.42c	2.42c	2.42c	2.32c	2.32c	2.345	2.345c
Sheets No. 10 Blue Annld., Phila	3.27c	3.22c	3.27c	3.12c	3.12c	3.12c	3.07c	3.02c	3.02c	2.92c	2.92c	3.02c
Billets, Open Hearth, Philadelphia	$45.30	$45.30	$44.80	$44.30	$44.30	$43.30	$43.30	$42.30	$41.30	$41.30	$41.30	$46.80

OLD MATERIAL

No. 1 Heavy Melting Steel	$18.15	$18.50	$17.00	$15.35	$14.70	$15.65	$15.60	$17.00	$17.75	$17.20	$18.05	$19.00
No. 1 Railroad Wrought	20.10	21.35	19.00	18.40	17.75	17.75	18.05	18.50	18.75	18.75	18.95	19.00
No. 1 Cupola Cast	20.70	20.35	19.25	18.35	17.10	17.90	17.80	18.00	18.40	17.95	18.25	19.50

*These prices are based on English low phosphorus iron at Philadelphia.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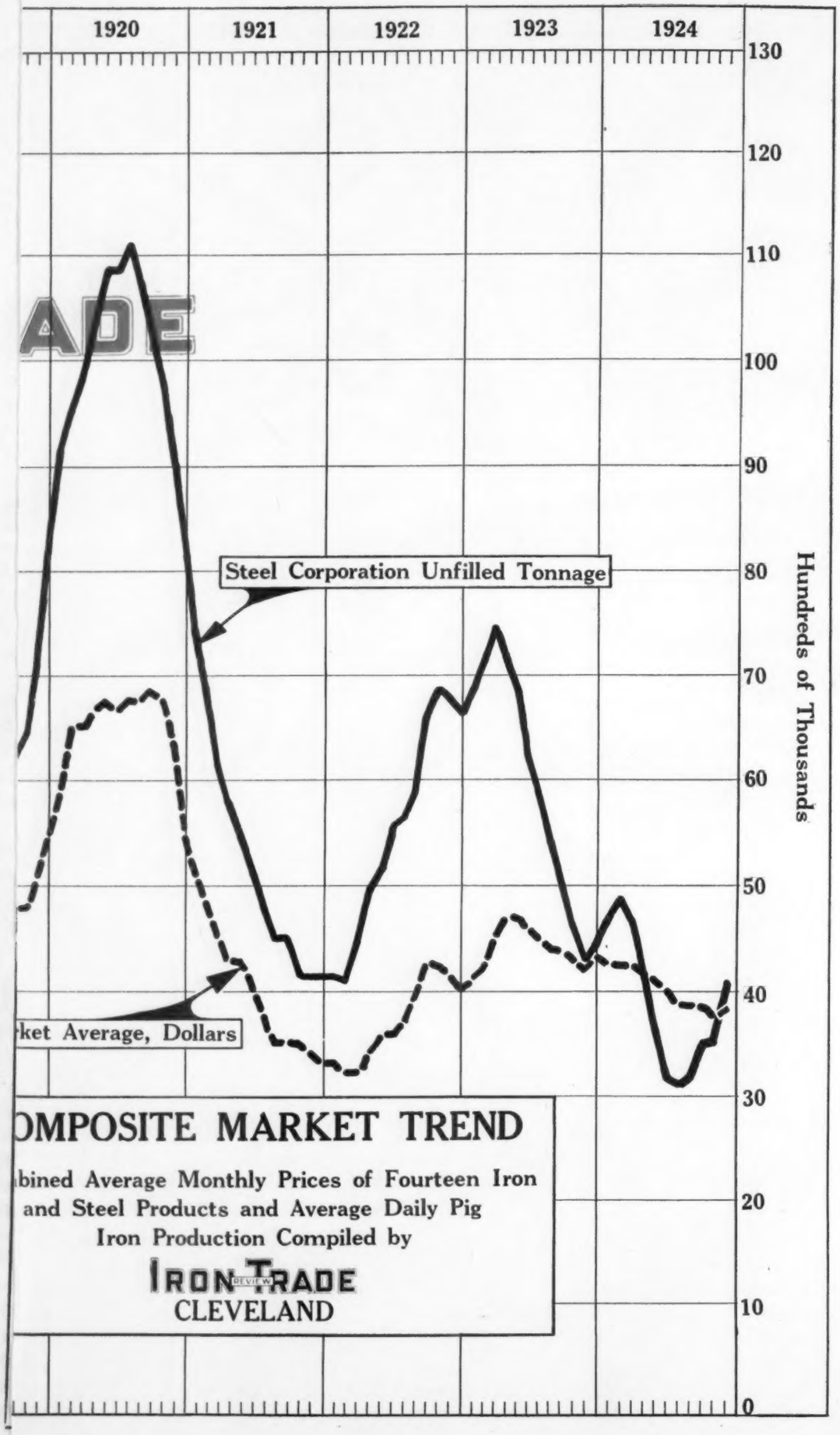
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IRON TRADE REVIEW
CLEVELAND

Pig Iron Had Troubles in 1924

Low Records in Production and Prices Compared with Preceding Period—Middle of Year Brought Slump but Later Months Overcame Some Losses—Furnace Stocks Heavy—Much Foreign Iron Sold

WITH production peaks in the previous year never before reached in pig iron, producers considered it more or less meritable that 1924 should develop comparatively low points in output and prices. Heavy stocks of iron for sale accumulated largely in the previous year were an important factor in the market's behavior. At one time in 1924 these exceeded 1,250,000 tons. The first three months starting off under the impetus of the heavy buying and consuming rates of the closing days of 1923, hopes were early expressed for year's output exceeding that of 1923. The total for 1924, approximately 31,100,000 tons, compares with 40,361,146 tons for 1923.

January and February were good selling months in all sections. In March, interest commenced to dwindle rapidly and the second quarter was devoid of interesting features. In August and September the market commenced to show signs of life, prices were advanced 50 cents to $1 per ton. Sustained demand was lacking and prices soon settled back. Not until after the presidential election did real buying materialize, commensurate with that of November, 1923. During that month, in 1924, between 1,500,000 and 2,000,000 tons were sold largely for first quarter of 1925 and in some cases furnaces obligated their entire first quarter make. Accordingly in November and December prices grew somewhat stronger and while they did not reach the high levels of the year, namely those of March, they did rebound to the plane prevailing in January. No. 2 foundry iron and malleable started in January at $22 valley, increased by March to $23.50 but on a gradually declining scale reached or slightly shaded $19 by September. After a slight upturn the market went down again only to rebound the latter part of the year, to $20 to $22, valley. Early in December at least one interest obtained that maximum level in the spot market for the first quarter of 1925. The trend of steelmaking prices during the year is graphically shown by the accompanying table of comparative averages by months for 1923 and 1924, as compiled by W. P. Snyder & Co.

The Year's Range

	High	Low
No. 2 foundry, valley	$23.50	$19.00
Basic, valley	22.00	18.50
No. 2 foundry, Chicago	24.50	19.50

	1924		1923	
	Bess.	Basic	Bess.	Basic
Jan.	$23.00	$22.00	$27.50	$25.583
Feb.	23.50	22.00	28.02	26.38
March	23.375	22.00	30.26	30.02
April	22.80	21.50	31.00	31.00
May	22.125	20.32	30.10	28.056
June	21.143	19.733	28.50	26.75
July	20.144	19.00	26.70	24.75
August	20.00	19.00	26.50	25.00
Sept.	20.00	19.00	26.50	24.50
Oct.	20.00	18.50	25.20	23.25
Nov.	20.32	19.68	23.032	20.81
Dec.	*21.25	*20.25	22.775	20.857
Average	*21.47	*20.25	27.17	25.56

*Estimated.

In New England the low point came in July when No. 2X foundry iron was sold at $23, delivered; Buffalo iron was sold at $22.66 delivered, or $17.75 furnace. Buffalo iron was back to $22 furnace in December. In New York territory, eastern furnaces which early in the year had quoted foundry iron at $22 to $22.50 on the base grade at their plants, reached $19.50 or less by September and October, but advances in November took them back to the basis of the early part of the year. Chicago sellers started out with $23.50, reached $24.50 in February, but by June had receded to $19.50 to $20. The November reaction took their prices to $21.50 to $22 and the year finished with the market tending higher.

Often during the year steelworks furnaces, as in 1923, established market levels which were below producing costs for the merchant blast furnace operator. Steelmakers could not sell enough finished steel to consume even their curtailed pig iron output and became even greater factors in pig iron sales effort than in former years.

To some degree also, domestic producers' efforts were hampered by the sale of imported iron below domestic prices. Imports of iron in the year totaled about 200,000 tons. In Boston about 15,000 tons of continental iron arrived in the year, as compared with 76,000 tons in 1923; receipts of Indian iron totaled about 1000 tons monthly from April to the end of the year. In New York foreign iron competed sharply with the domestic product. Occasional lots of French and German iron were sold in Philadelphia. Indian iron receipts there increased greatly while sales of English low phosphorus iron were large and when Holland's new blast furnace became active its sales in the East and along the Pacific Coast were considerable.

As usual, sanitary ware, cast iron pipe and radiator manufacturers were large purchasers of foundry iron. These frequently bought 10,000 to 25,000 tons or more. Purchases of steelmaking iron by steelmakers were relatively light in the year.

Coke Output Cut in Half

Midyear Production Low—By-Product Gains

RESTRICTED consumption of standard beehive coke by blast furnaces in 1924 is illustrated by comparative production figures for the Connellsville region. Estimating the final few weeks, 1924 production will not exceed 6,400,000 tons, or less than half the 1923 output, 13,103,350 tons. The low point was the week of Aug. 9, with 46,320 tons, while the largest week in 1924 was that ending March 15, with 249,250 tons. This compares with the high point of 1923 when 306,720 tons were made during the week ended June 23. Even with comparatively low total output for 1924, much of it was purchased by customers other than blast furnaces. During second and third quarters large quantities of medium sulphur and standard went to smelters and refineries and at various times, gas companies bought Connellsville coke in

The Year's Range

	High	Low
Furnace, Connellsville	$4.25	$2.85
Foundry, Connellsville	5.00	3.85

lieu of anthracite coal. To a certain extent, however, these tonnages were offset by purchases of by-product coke by a number of blast furnaces, although on the other hand a number of steel companies ordinarily using their own by-product fuel found it necessary to purchase beehive in appreciable tonnages for filling in purposes, in January and again in the closing months of the year.

While at one period in mid-year spot prices reached heights somewhat above contract levels because of the way production was kept in check to equal commitments, toward the end of the year contract prices assumed their more or less normal position above spot prices. This was due to the increasing brightness of the outlook for 1925 with cokemakers demanding more money. Contracts for first quarter 1925 were written in November at $3.25 to $3.50, and in December at $3.50 to $3.75, finally reaching $4, whereas the spot market in November was quoted at $3 to $3.15 and in the final month at or slightly above $3.25.

The year started with $4.25 the prevailing figure on furnace coke and some second quarter contracts were written at $4.50. In May and June these were revised to harmonize more with the going market levels, these revisions being made possible by a 20 per cent wage reduction in mine and oven labor rates. Contracts taken late in the year for early 1925 delivery all carried a wage clause permitting an increase in the cost of coke of 60 cents to $1 if the coke producers find it necessary to advance wages during first quarter. Medium sulphur coke in January brought $3.50 to $3.65 but in September it had fallen to $2.50 to $2.75. In June, however, it was on a par with standard at around $3 to $3.15.

Foundry coke early in the year was quoted at $5 to $5.75 and while in September the low point was reached with $3.85, the market in October and November was quoted at $4 to $4.50 and December started with $4.25 to $4.75 and with a $5 minimum on 1925 contracts. Premium brands commanded a price of 50 cents to $1 per ton above ordinary standard selected 72-hour foundry fuel all year.

In the East the use of by-product foundry coke is growing and while Connellsville oven operators were curtailing, the northern New Jersey producer maintained practically full operation. Its January price of $10.91 delivered declined for the second quarter and the remainder of the year to $10.41. In New England the January price was $12.50, declining in July to $11.50. In Chicago, however, greater declines were noted and while the year started at $12.50, July 1 found the price declined to $10.75, that month being the low point in the year's demand.

Warehouse Business Dull

Imported Steel Hurts Eastern Sellers

AT BEST, warehouse business in iron and steel in 1924 was only fair. Barring an occasional upturn, the price trend was down over the entire year and a natural concomitant of this condition was hesitant and meager buying.

In a general way, the first quarter was the best for the warehouse interests. The second and third quarters plotted the bottom of the curve, with late August and early September the low. In some sections, October was the best month of the year. October through the middle of December saw business on the plateau it attained when business began discounting the favorable action. The customary pre-inventory falling-off closed the year.

To an extent the warehouses gained from the decrease in mill business through the second and third quarters but not sufficiently to offset the loss in their normal trade. Some consumers of iron and steel were willing to pay the additional charge for warehousing in order to keep their stocks at a minimum.

European steel, chiefly bars and shapes, figured in warehouse business along the Atlantic coast. This steel was a factor throughout the year at Philadelphia and helped to unsettle the market. An advantage was lower cost but among the disadvantages were bending in transit and laxness in rolling to specified dimensions.

Naturally the warehouses met the recessions in mill prices of iron and steel, but with the customary financial disadvantage in following down. Warehouse prices at Philadelphia suffered irregularities because of the pronounced weakness at times in mill prices on plates and shapes. At Chicago competition for sheet, wire and nail business reduced the accepted warehouse differential. Some foreign steel was sold at Boston for $6 to $8 a ton under the price for Pittsburgh iron.

Semifinished in Excess

Usual Shortages Not Met by Users

INSTEAD of the periodical shortages of semifinished materials which were encountered in 1923 by various conversion mills because producers needed their own steel for finishing operations, excesses were the general rule. Sheet bars, billets, slabs, skelp, etc., all were available beyond requirements throughout 1924. Early in the year makers found it necessary to curtail sales of semifinished to give their own wire products departments more material. This worked a hardship upon nonintegrated wire rod users. Only once or twice did Steel corporation units, which made such spectacular sheet bar purchases in the open market in 1923, find it necessary to act similarly in 1924 as supply was ample.

The Year's Range

	High	Low
Sheet bars	$42.50	$37.00
Rerolling billets	40.00	35.50
Wire rods	57.00	45.00
Skelp	2.50c	2.00c

Buying in general tapered off after first quarter. In the Boston area it is estimated that semifinished sales equalled 75 per cent of 1923 and this is fairly representative of other sections. Billet buying in New England was somewhat interfered with by the importation of several thousand tons. In New York, however, imports were almost negligible.

Domestic purchases of sheet bars and other forms for first quarter from regular sources of supply were heavy late in December, 1923, and early in January, 1924. Specifications were liberal for a time but became more restricted as consumption decreased from April onward, particularly on sheet bars when sheet mill operations slumped decidedly in May. This became so marked that practically the only way second quarter specifications could be obtained was by offering price concessions, adjustments on extras, etc. Even this was not markedly successful and the total carryover from second to third quarter was large in all territories. Contracting effort for third quarter was therefore somewhat minimized. In Sep-

tember considerable fourth quarter contracting took place in a quiet way and again in November and December when first quarter 1925 contracts were accepted. In some cases tonnages were placed purposely high in anticipation of better consumption next year.

Price trends were downward. Sheet bars starting the year at $42.50, held at that figure until April when $41 was introduced. From then on the decline was steady until $37 and $37.50 was reached for fourth quarter and for first quarter of 1925. For 4 x 4-inch rerolling billets, $40 was the prevailing figure at the year's start with $2.50 differentials for small billets. By the end, the quotation had reached $35.50 by steady declines, that figure coming out in October and November. At times the size differential declined to $1.50 and often was wiped out entirely. The $5 differential for forging billets was insisted upon all year.

Wire rods at $51 in January, had declined to $45 by late September but rebounded to $46 in November and late in that month a $2 advance was inaugurated, $48 being asked for first quarter 1925. Skelp activity was largely restricted to negotiations between producers and their own private customers and seldom resulted in open market inquiry. Price largely was governed by what was obtainable in the plate market where some low figures were brought to light. Early in the year 2.35c to 2.50c was quoted and these descended to 1.90c to 2.00c, which was the quotable market in third and fourth quarters. The year ended with strong efforts being made to obtain 2.00c or higher.

Pipe Demand Held Steady

Change in Quotation Base Disturbs

STEADY demand, though often in relatively small tonnages, but without price fluctuations, characterized the standard full weight merchant pipe market throughout 1924, with basing discounts of April 19, 1923, applying, namely 62 off on black and 50½ off on galvanized. In May certain distributors began to bear down somewhat on the market expecting that pipe would reflect the weakness generally true of other steel products. These endeavored to dispose of their stocks, in many cases involving large tonnages, often at or below cost. Mill levels held, however, and they soon found they could make replacements only at quoted discounts plus their regular preferential.

When the Pittsburgh plus method of quoting prices was abolished late in September, a Lorain base identical with Pittsburgh (62 off) was established; one at Indiana Harbor and Evanston, Ill., $2 per ton higher (60 off) was inaugurated, as was one at Chicago, $5 per ton higher (59½ off). For the same reason the zone system of quotations on oil country goods, line pipe, etc., was abolished and makers quoted delivered prices from Pittsburgh, Lorain and Chicago mills. In connection with oil country goods, some concessions were made during one or two summer months of low demand, but generally speaking this market held well through the year, pipe and tin plate being about the only items in finished steel of which that can be said.

Sustained buying rates among jobbers made possible by huge demands upon them by large building programs enabled pipe producers to maintain operating schedules which usually were from 10 to 25 per cent higher than other steel finishing departments and which early in the year reached practically 100 per cent. Toward midyear these were curtailed somewhat because of heat and other reasons but quickly recovered. When standard full weight pipe demand fell off somewhat, compensation came from an increased buying rate in line pipe, numerous installations requiring 5000 to 50,000 tons, with larger ones occasionally being taken. These gave the mills backlogs, but they were quickly dissipated through heavy shipments. During last half such buying lacked.

Wrought iron pipemakers, busy in the early part of the year, experienced periods of dullness in the second and third quarters but as in other lines found considerable impetus following the November election.

Sales of boiler tubes and other tubing were spasmodic and usually could be arranged only through concessions under officially quoted prices, some deep cuts being made.

Changes in Discounts on Steel Pipe

Jobbers, Carloads, Base, Pittsburgh

Date	Sizes in inches	Butt Weld Basing Black	Butt Weld Discount Galv.
Jan. 1, 1910 to Oct. 1, 1910	¾ to 6	78	68
Oct. 1, 1910 to Oct. 2, 1911	2 to 3	80	70
Oct. 2, 1911 to Dec. 1, 1911	2 to 3	81	74
Dec. 1, 1911 to Dec. 15, 1911	2 to 3	83	76
Dec. 15, 1911 to Jan. 1, 1912	2 to 3	83	76
Jan. 1, 1912 to July 1, 1912	2 to 3	82	75
July 1, 1912 to July 24, 1912	2 to 3	82	75
July 24, 1912 to Sept. 10, 1912	2 to 3	81	74
Sept. 10, 1912 to Jan. 1, 1913	2 to 3	80	72
Jan. 1, 1913 to April 12, 1913	¾ to 3	80	71½
April 12, 1913 to May 27, 1913	¾ to 3	79½	71
May 27, 1913 to Aug. 8, 1913	¾ to 3	79	70½
Aug. 8, 1913 to Oct. 27, 1913	¾ to 3	80	71½
Oct. 27, 1913 to Feb. 2, 1914	¾ to 3	80	71½
Feb. 2, 1914 to April 20, 1914	¾ to 3	79½	71
April 20, 1914 to Nov. 2, 1914	¾ to 3	80	71½
Nov. 2, 1914 to Feb. 11, 1915	¾ to 3	82	72½
Feb. 11, 1915 to May 1, 1915	¾ to 3	80	69½
May 1, 1915 to June 1, 1915	¾ to 3	79	68½
June 1, 1915 to June 17, 1915	¾ to 3	79	63½
June 17, 1915 to Aug. 15, 1915	¾ to 3	79	57½
Aug. 15, 1915 to Nov. 1, 1915	¾ to 3	79	63½
Nov. 1, 1915 to Jan. 4, 1916	¾ to 3	78	63½
Jan. 4, 1916 to Jan. 20, 1916	¾ to 3	77	62½
Jan. 20, 1916 to Feb. 15, 1916	¾ to 3	76	60½
Feb. 15, 1916 to Feb. 29, 1916	¾ to 3	75	59½
Feb. 29, 1916 to Mar. 15, 1916	¾ to 3	74	57½
Mar. 15, 1916 to Mar. 29, 1916	¾ to 3	73	55½
Mar. 29, 1916 to April 21, 1916	¾ to 3	72	53½
April 21, 1916 to July 24, 1916	¾ to 3	70	50½
July 24, 1916 to Sept. 7, 1916	¾ to 3	70	55½
Sept. 7, 1916 to Nov. 1, 1916	¾ to 3	69	55½
Nov. 1, 1916 to Nov. 15, 1916	¾ to 3	69	55½
Nov. 15, 1916 to Dec. 4, 1916	¾ to 3	68	54½
Dec. 4, 1916 to Dec. 30, 1916	¾ to 3	66	52½
Dec. 30, 1916 to Feb. 14, 1917	¾ to 3	64	56½
Feb. 14, 1917 to Mar. 5, 1917	¾ to 3	62	48½
Mar. 5, 1917 to April 2, 1917	¾ to 3	60	46½
April 2, 1917 to Nov. 6, 1917	¾ to 3	55	41½
Nov. 6, 1917 to Jan. 1, 1919	¾ to 3	51	37½
Jan. 1, 1919 to Mar. 21, 1919	¾ to 3	54	40½
*Mar. 21, 1919 to April 13, 1921	¾ to 3	57½	44
April 13, 1921 to July 7, 1921	1 to 3	62½	50
July 7, 1921 to Sept. 16, 1921	1 to 3	64½	52
Sept. 16, 1921 to Dec. 15, 1921	1 to 3	68½	56
Dec. 15, 1921 to Aug. 17, 1922	1 to 3	71	58½
Aug. 17, 1922 to Oct. 19, 1922	1 to 3	68	56½
Oct. 19, 1922 to Feb. 13, 1923	1 to 3	66	54½
Feb. 13, 1923 to April 19, 1923	1 to 3	64	52½
‡April 19, 1923 to date	1 to 3	62	50½

*Level adopted by independent companies Dec. 31, 1920.

‡Since Sept. 21, 1924, Pittsburgh and Lorain basing discounts, jobbers' carloads, Evanston Ill., and Indiana Harbor, Ind., take differential 2 points less discount or $4 per ton higher net. Chicago takes differential 2½ points less than Pittsburgh-Lorain basis or $5 per ton higher net.

Scrap Market Again Points Way

First Reflects Impulse Toward Higher Basis and Precedes Other Commodities in March to Better Things—Advances Made in Methods of Handling and Preparing Product—Some Marketing Changes

IRON and steel scrap rode out 1924 on a crest of high prices and improved consumer buying. Sensing the favorable election, practically all dealers became pronouncedly bullish in the last week of October and in the last two months of the year the market generally regained most of the price ground lost in the second and third quarters. The year closed with consumers' stocks uniformly low, consumers' order books the heaviest of the year, and consumers gradually getting into a scrap-buying stride.

In a general way, scrap prices advanced from January to February, and from this peak declined until June. Through July, August and September there was a gradual gathering of strength which culminated in the decided advance late in October. Shipments of scrap about paralleled this movement in price. The cast grades were rather weak throughout the year. The inflow of railroad specialties was greater. While the great majority of scrap users remained aloof from the market during the summer months, some of the better-entrenched consumers steadily accumulated stockpiles at buyers' prices.

The proportion of scrap used in eastern Pennsylvania steel plants increased in 1924. Considerable ship scrap, as the aftermath of reduced naval armament, came into this market. Eastern Pennsylvania prices continued to work toward a level relatively higher than the Pittsburgh district. Eastern blast furnaces consumed more borings and turnings, cut skeleton and other kinds of light scrap. The Bethlehem Steel Co.'s penalty system of buying scrap, eliminating rejections, continued to make it the preferred buyer in the East.

The Year's Range	High	Low
Heavy melting, Pittsburgh	$15.40	$21.60
Heavy melting, Chicago	13.55	18.00
Heavy melting eastern Pa.	14.20	18.95

The scrap markets in Youngstown, Canton and adjacent territory frequently made prices for Pittsburgh. In October, heavy melting steel at $19.50 to $20 at Pittsburgh was $1 higher than pig iron. Railroad lettings, chiefly the Pennsylvania's monthly list of 25,000 to 40,000 tons, were quickly bid in by dealers, usually to apply on short orders, and bids were high. In the latter months of the year dealers at Chicago paid the railroads 50 to 75 cents a ton more than consumers were paying. Barring the Illinois Steel Co., which had accumulated considerable melting steel in the summer, stocks of Chicago consumers in November and December were abnormally low at a time when order books were rapidly filling. New England trading in heavy melting steel was about 70 per cent of the 1923 total. A feature of the year was the conclusion of arrangements whereby the McKinney Steel Co., at Cleveland, began taking over all of the New York Central railroad's scrap, reselling what it could not utilize. This plan stood the test of a complaint by scrap dealers to the interstate commerce commission.

The tendency of the iron and steel scrap business to assume the proportions of a manufacturing industry was more pronounced last year. Many yards in the eastern Pennsylvania, Chicago, Pittsburgh and Youngstown districts were improved and their facilities now are the most advanced in scrap history. One Chicago scrap yard began putting out a specially-good grade of cast which commands $1 or more over ordinary No. 1 cast.

By-Products Fared Well

Steel Depression Cut Output, Saving Glut

WHILE the coal by-products market suffered some reverses, 1924 averaged fairly well. In first and last quarters business was active, and while during the middle months demand slowed down, the depression in the steel industry checked production, with a result there was no large accumulation of supplies and prices in the main were held steady. This stability in prices was particularly noticeable in light oil distillates, the leading sellers holding their quotations unchanged throughout virtually the entire year by careful output control.

The Year's Range	High	Low
Benzol	$0.25	$0.22
Toluol	0.25	0.23
Sulphate ammonia	2.725	2.35

A notable exception was sulphate of ammonia. When production began to slump, prices dropped also. Seasonal contracting in sulphate of ammonia by the fertilizer industry, which usually takes place late in May or early in June, did not develop until August. This delay, with the accompanying uncertainty as to what the buying would amount to, in conjunc-

Coal Tar Products Market in 1924

Producers prices, f. o. b. works

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Benzol	$0.22	$0.25	$0.25	$0.25	$0.25	$0.245	$0.25	$0.25	$0.25	$0.25	$0.25	$0.25
Toluol	0.235	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Solvent Naphtha	0.23	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Phenol	0.265	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Naphthalene Flakes	0.08	0.075	0.06	0.055	0.055	0.055	0.055	0.05	0.06	0.06	0.06	0.06
Naphthalene Balls	0.09	0.085	0.07	0.065	0.065	0.065	0.065	0.06	0.07	0.07	0.07	0.07
Sulphate of Ammonia	2.725	2.725	2.725	2.65	2.625	2.575	2.50	2.35	2.50	2.60	2.65	2.675

tion with heavy European stocks offered at sharp concessions, depressed the market.

Incidentally, hesitancy in buying on the part of fertilizer manufacturers was due to unsatisfactory business experienced during the preceding two years or so and to a desire on their part to see how the situation was going to develop before making future commitments.

Buying, when it did set in, was sufficient to practically absorb production for several months, notwithstanding the steady increase in operations beginning in September. As may have been inferred, the export market on sulphate was affected by sharp competition from Europe, more particularly from Germany.

Motor fuel demand was better than in the preceding year, but with production restricted supplies were well below requirements.

Revolution in Wire Base

Change in Quotation Method Disturbs

ABANDONMENT of the Pittsburgh-plus basis of quoting wire and wire products in the middle of September revolutionized the price structure of these commodities and at the close of the year the transition to the new price basis had not been completely bridged.

The decision of the Steel corporation to abide by the edict of the federal trade commission caught the industry by surprise. It swept away the comparatively simple method of adding, for Chicago for example, the 34c freight from Pittsburgh; it brought with it a flood of delivered prices and stressed as never before the importance of the rate structure.

In complying with the commission's order the American Steel & Wire Co. established Pittsburgh and Cleveland on a joint basis. For products manufactured at other mills differentials over Pittsburgh-Cleveland were announced. These differentials were $2 for Waukegan, DeKalb and Joliet, Ill., and Duluth, which at first was $4; $3 for Worcester, Mass., and Fairfield, Ala., and $1 for Anderson, Ind. Products not made at these mills were to be shipped from the nearest mill manufacturing them and priced there.

The Year's Range

	High	Low
Nails, Pittsburgh....	3.00c	2.75c
Wire, Pittsburgh ...	2.75c	2.50c

In a general way, the independent mills have met the delivered prices of the leading interest. This has necessitated the absorption of several dollars per ton in freight charges by independent makers in the Pittsburgh and Wheeling districts. Some undercutting by western independents resulted from the confusion attending the birth of the new price system, but as the year closed prices were tending toward regularity.

Business in wire and wire products in 1924 was spotty. It was fair in the opening and closing two months of the year but rather light through the summer. Consumers were aware of the mills' ability to make prompt shipments, so they and most jobbers shouldered the burden of stock-carrying upon the mills. Mill operations may be said to have opened the year at 80 per cent, dropped to 40 per cent in July but rebounded to 60 per cent in December. In January, the mills had 60 to 90-day backlogs but in the third quarter were fortunate to have two-week backlogs on 50 per cent schedules.

In the East the mills continued to sell direct to consumers and retailers and cut heavily into jobbers' business. New England sales of all wire products were about 70 per cent of 1923. In the East wire fencing demand showed a gain but barbed wire consumption slumped. In Pittsburgh and to the West fencing buying was a disappointment in the spring and practically nil in the fall. Consumption of wire products in the western agricultural areas felt the heavy hand of the financial distress and replacements scheduled for spring were put over. The year closed with good prospects of improvement in this respect.

The year opened with plain wire at 2.75c, base Pittsburgh, and wire nails at 3.00c, base Pittsburgh. In May there was a decline of $2 a ton, in July $1, in August $1 and in September, when Pittsburgh-plus was discontinued, another $1 and in November $2 rise.

Tin Plate Hurt by Weather

Crop Situation Lessened Can Demand—Price Steady

EXTREMES in specifying rates on the part of tin plate users, affecting mill operations, featured the 1924 tin plate market. Early in the year buying was so heavy by canmakers who had been busily specifying during the closing weeks of 1923, that tin plate mills were able to operate at 90 to 100 per cent for almost four months. During the first week in March, the American Sheet & Tin Plate Co. was on a 98 per cent basis, which perhaps is as near as any plant ever gets to 100 per cent. During last half, particularly third quarter, operations were below 50 per cent, mainly because tin plate consumption was not up to expectations. The mills rendered excellent service in anticipating requirements and in making up material in advance of orders and shipping out promptly on specifications.

Abnormal weather conditions, playing an important part in connection with demand for galvanized sheets, pipe, nails and other steel products formed the chief tin plate deterrent. The rainy season in May caused late planting of many vegetable crops, and summer heat prevented proper crop maturity, hence third and fourth quarter specifications were particularly slim. Notwithstanding this interference 1924 consumption will possibly be only 10 or 15 per cent under 1923. Because a gain of at least 10 per cent was expected in the year it really is about 25 per cent short. Production similarly was contracted from the expected gain over last year when the output was approximately 1,506,862 tons. Better schedules were possible late in the year, due to some canmakers anticipating their early 1925 wants.

Notwithstanding fluctuation in demand the price prevailing since the third quarter of 1923 of $5.50 held well. In September a $5.60 base at Gary, Ind., was established coincident with the abolition of the Pittsburgh plus method of quoting prices and while some independents quoted $5.70 at Chicago proper, the leading interest maintained $5.65 there throughout the fourth quarter, reaffirming its prices Nov. 25 for first quarter of 1925. Export demand continued good most of the year and some fairly large orders were booked late in the year. Oil companies took considerable tonnages for their export shipments of oil and its products. Export prices were generally high.

Shape Buying Makes High Record

Steady Bookings Through Year, Without Peaks or Dips, Bring Total Awards Above Previous Best Marks—Factors Troubling Other Markets Affected Building Only Slightly—Plain Material Prices Sagged Sharply Through Midyear

STRUCTURAL buying in 1924 again broke all previous records. Characterized by neither the high peaks nor excessive dips that featured the spectacular trading of 1923, it appears to have surpassed the high mark set by that year. Figures compiled by the department of commerce for the first 10 months show a substantial margin over the corresponding period of 1923, and final returns for November and December probably will bring the grand total to approximately 2,000,000.

The very steadiness of buying was notable in itself. Notwithstanding the general business uncertainty which, caused in a large measure by the political situation, set in in the late spring and eventually forced iron and steel operations to the lowest level in two years, structural activity was well maintained. With the exception of May and August, when bookings as reported by the department of commerce fell off to around 145,000 tons, the full extent of the fluctuation for the months reported lay roughly between 160,000 and 180,000 tons. With confidence restored by the result of the election, November developed the heaviest total of the year. In the previous year, the range was between approximately 120,000 and 230,000 tons.

Shape prices, however, were not only less stable, but uniformly lower. After holding virtually steady for the latter

The Year's Range	High	Low
Shapes, Pittsburgh ..	2.50c	2.00c

eight months of 1923 and the first two months of last year at around 2.50c, Pittsburgh, the market began to sag. By the end of first quarter, prices were around 2.30c, Pittsburgh, and three months later were about 2.10c, Pittsburgh, with 2.00c being done in some instances.

Prices continued to dip, with the range getting down to 1.80c to 1.90c, Pittsburgh, and with some scattered jobs going at even less. Not until the closing days of November did the market again reach 2.00c, Pittsburgh, or the equivalent. The year closed with the market slightly above that level.

The trend of Chicago prices was much the same. Starting the year at 2.60c, Chicago, they began to slip in April and with $2 steps fell to 2.00c Chicago, the latter part of September. About Nov. 1, the market stiffened to 2.10c, and within two weeks another advance to 2.20c was announced.

The great bulk of the year's business continued of a general commercial and housing character. Office buildings, lofts and apartments took a heavy tonnage. Railroad buying, with the possible exception of that of 1923, was far better than in any other period in recent years, with the placing of 25,000 tons by the Santa Fe the largest individual order. However, as a whole, this demand of this sort was still restricted and much the same was true of industrial buying. Over-expansion of the war and postwar days continued to be reflected.

Structural shops enter the new year with sufficient business on books to keep them going well into second quarter. Buying for spring delivery, particularly at New York and Chicago, exceeded that of the preceding year. The most important labor difficulty of the year was in New York city, where the iron workers made an unsuccessful fight of several weeks for recognition of the closed shop principle. This coming fairly late in the spring, did not materially affect buying, but for a while seriously hampered construction, which then was at its peak.

Following is a comparative statement of reported bookings:

	1924	1923	1922	1921
Jan. ...	176,058	179,375	72,100	32,000
Feb. ...	179,956	192,569	78,700	25,600
March .	174,663	230,085	139,300	52,300
April ..	160,267	193,932	200,968	55,900
May ..	145,820	140,681	185,065	50,800
June ...	161,763	125,993	168,894	66,900
July ...	170,884	125,344	158,012	60,200
Aug. ..	146,875	143,814	156,559	59,000
Sept. ..	165,343	130,239	146,827	86,000
Oct. ...	157,956	122,153	133,037	97,800
Nov. ..	*242,314	132,772	112,367	99,800
Dec. ..	*176,282	195,721	138,737	71,500
	2,058,131	1,912,678	1,690,566	759,100

*Estimated.

Two Heavy Bar Campaigns

First and Last Quarters Bring Most Demand

MERCHANT steel bar mills enjoyed two heavy buying movements in 1924 one in the first quarter for both prompt and second quarter delivery and the other immediately following the presidential election in November. Selling in November probably was the heaviest of any month. In both these movements consumers and jobbers joined and there was no suggestion of speculative tendencies.

Second and third quarter buying was exceedingly light. Because mills could make prompt deliveries incentive for future buying was lacking. Actual mill activity probably was greatest toward the end of first quarter, when mills foresaw the coming decline in prices

The Year's Range	High	Low
Bars	2.40c	2.00c

and sought to clean up their books.

Without exception, 1924 was a year of falling prices in every district. At Chicago, 2.50c, Chicago mill, reigned over the first quarter but beginning in April there was a decline that was not arrested until early November. Two advances raised bars to 2.10c, but much tonnage was driven in by the threat of these advances. Bars at Pittsburgh fell from 2.40c in January to 2.00c in December, with the year concluding with a probable $2 advance.

The eastern market largely reflected the variation at Pittsburgh and irregularities caused by keen competition.

European bars disturbed the market somewhat along the Atlantic, Gulf and Pacific coasts. The usual complaints of failing to meet specifications and bending in transit were heard. Jobbers took a majority of this foreign tonnage, with a good volume going into reinforced concrete construction. Where jobbers or consumers carefully selected their mills and paid slightly higher prices less grief was encountered with this foreign steel.

November brought easily the best feeling of the entire year in bars. The agricultural implement industry was

giving indications of renewed activity. Reinforcing bar warehouses then did the best buying of the year, 18,000 tons having been placed with Chicago mills within a week for first quarter delivery. Warehouses and practically all consumers in western territory had protected themselves against normal first quarter bar requirements by the first week in December.

Bar iron mills more than ever before felt the decrease in railroad buying. Before the war, trunk lines entering Chicago were consumers of 8000 to 15,000 tons a year each, principally for freight cars, but in 1924 railroad buying averaged only a couple thousand tons. Through second and third quarters most mills operated single-turn alternate weeks. Some improvement in buying brightened the last 60 days of the year. Bar iron sold at about 2.40c, Chicago, in January but fell away to 2.00c, in November and regained only $1 of this decline in the better days of December.

Rail steel bars closed the year in a most comfortable position, most makers having gone through December at a high rate and having a fair backlog to cushion them through January. Manufacturers of implements and beds probably placed more tonnage in the last quarter than in the preceding three. The outlook for spring fence post trade is much brighter than a year ago. Rail steel bars followed soft steel bars and bar iron down in 1924, following from about 2.30c, mill, in January to a low of 1.90c to 2.00c in late November.

Reinforcing bars at most points were selling at the end of the year at much the same level as at the beginning. The greatest variation was at Chicago, where competition in the fall brought out some quotations practically as low as the mill price. The industry braced with the formation of a reinforcing institute at Pittsburgh and the aim of a differential of $10 over mill price.

Plate Orders Below Need

Large Railroad and Oil Buying Insufficient

The Year's Range	High	Low
Plates	2.50c	1.80c

WHILE large tonnages of steel plates were placed for cars and locomotives, for requirements of the oil industry and a great many other purposes, mill capacity in this line is so large that producers all through 1924 were unable to book enough tonnage to satisfy them. Eastern mills probably fared worst, their operations over a considerable period averaging 30 per cent or less. Even after improvement in demand in November, their output did not go much above 50 per cent.

As a result, more attention than ever was given to effecting economies wherever possible. One interesting development along this line is the use which at least two platemakers are making of their shearings. Instead of cutting them up for open-hearth scrap, these mills have installed presses and are doing an extensive business in stamping out S-wrenches and other finished flat articles, and in forming hub caps and other parts for automobiles, etc.

Lack of sufficient plate business also has led to efforts to manufacture specialties. Another mill in 1924 joined the ranks of diamond floor plate manufacturers, making a total of four which now produce this specialty in addition to the usual line of plates. The use of floor plates has been pushed considerably and of late substantial tonnages have been sold for installation as treads on roads and bridges, thus considerably lengthening the life of such structures.

Shipbuilding again was a poor source of demand . In the power field the business is tending to become smaller; many manufacturers are switching to central power plants for current so that there is not so much demand for boilers for individual installations. The year 1924 did not see as large a tonnage bought for oil storage as in some previous years, but miscellaneous requirements of the oil industry were large. A feature of the market was the development in gasholder construction to the point where individual holders now take more tonnage than ever before. With the constant extension of the use of gas for cooking and lighting, the outlook for the gasholder business is regarded as good.

Domestic freight car buying in 1924 well exceeded that of the preceding year. Although not all returns are in, orders involved at least 135,000 cars, and likely more. This compares with about 103,000 in 1923. Little in the way of export business was noted. Following is a comparative statement of freight car buying for domestic use from 1921 to 1924:

	1924	1923	1922	1921
January	8,150	15,000	11,000	1,700
February	41,350	9,300	14,500	200
March	13,150	42,479	12,000	1,400
April	10,250	9,800	31,500	350
May	511	2,200	18,250	250
June	438	1,785	13,100	1,500
July	886	1,450	13,700	900
August	5,980	2,777	1,610	150
September	27,630	897	10,350	550
October	4,885	1,125	12,700	6,500
November	12,720	5,050	18,500	7,000
December	*10,000	11,600	23,255	550
Total	125,931	103,487	180,465	22,050

*Estimated.

Locomotive demand fell off sharply, compared with the preceding year. It appears doubtful if orders will total over 1100, against about 2000 in 1923.

Much Cast Pipe Demanded

Much Small Buying Makes Large Total

The Year's Range	High	Low
Birmingham	$44.00	$39.00
Chicago	57.00	50.00
New York	66.10	62.10

EXCEPTIONALLY heavy buying of cast iron pipe by the larger industrial cities and their utilities, principally the gas companies, offset the marked decline in buying on the part of the small municipalities and enabled the manufacturers of cast iron pipe to experience a good year in 1924. In point of tonnage the year might be considered normal and that the market was attractive is evidenced by the receipt of some foreign pipe at New Jersey and California points, yet the industry lacked balance.

New York, Detroit, Cleveland, Milwaukee, Indianapolis, Cincinnati and similar highly-industrialized centers placed cast iron pipe beyond their normal requirements. Especially was this true of Detroit, both the city and its utilities.

From January to the end of March prices rose slightly, but beginning with the second quarter a gradual decline swept over the remainder of the year. From a Birmingham base of $44 to $46 in January the market fell away to $39 to $40 by the end of the year, with prices at that time giving evidence of reflecting the strength in southern pig iron.

Sheet Market in Wide Swings

Lack of Demand Through Most the of Year Caused Slack Operations but Late Months Saw Fair Revival—Price Irregularity Marked Most Periods—New Bases Are Established for Quotations

PRODUCTIVE capacity in sheets throughout 1924 remained for most part unsatisfied although in the opening months operations were heavy on account of the backlog of orders accumulated during the selling campagin of December, 1923. In February and March sheet mills ran practically full, following which a rapid decline set in until in June schedules were below 40 per cent. Toward the close of the year, blue annealed sheet sales were heavy and the plate and jobbing capacity of at least one maker, the American Sheet & Tin Plate Co., was at 100 per cent. The record for the fiscal year ended Oct. 31 for sheet mills reporting to the National Association of Sheet and Tin Plate Manufacturers is shown in the accompanying table.

When buying was under way, demand was diversified, practically every consuming line being represented. Large buying was done by the automotive industry early in the year and railroad car builders were active in the final quarter. In June and July, two particularly dull months, purchasers took only necessities, paring specifications as much as possible. Demand upon mills from jobbers was well sustained, since so many users supplied their needs in small lots from warehouses. One of the most interesting orders received by the leading interest and incidentally the largest single sheet order in history, materialized in September when the Argentine Republic government ordered 44,000 tons of galvanized sheets for locust traps. Other export orders were received spasmodically including some large orders of thin gage black sheets from Japan, particularly after its earthquake.

The Year's Range

	High	Low
Blue annealed, Pittsburgh	2.95c	2.60c
Black, Pittsburgh	3.75c	3.40c
Galvanized, Pittsburgh	4.95c	4.60c

It was only on occasions that independent producers were on a par with the American Sheet & Tin Plate Co. in price. Concessions by the former usually were $2 or $3 per ton, although sometimes as much as $5 to $7 per ton. In January, the American company's levels were 3.00c, 3.85c and 5.00c on blue annealed, black and galvanized sheets, respectively, with independents selling at 2.90c, 3.75c and 4.90c. After the leading interest reaffirmed its prices Feb. 19 for second quarter, independents made some effort to obtain them but slipped downward toward the end of March and from that time the spread grew wider until in June some sellers were $8 per ton lower. In June the leading interest began to meet this competition to the extent of $3 on blue annealed and $4 on black and galvanized. By August the open market levels were 2.70c, 3.50c and 4.60c. In September, bases were established at Gary, Ind., of $2 per ton higher than the Pittsburgh levels, with Chicago delivery $3 per ton higher. On Nov. 25, the American company announced increases of $2 in black to 3.60c, $3 in galvanized to 4.75c, and $3 in full-finished automobile sheets to 4.75c, f.o.b. Pittsburgh after some independents had announced increases. The full-finished sheet market had declined to 4.60c from the 5.35c level of first quarter.

Year's Sheet Situation Summarized

Total hot mills U. S.	Figures represent per cent of total hot mills	Month 1924	Sales	Per cent of capacity	Production	Per cent of capacity	Shipments	Per cent of capacity
686	72.6	October	221,773	70.7	247,222	78.9	229,771	73.3
686	70.0	September	227,520	79.0	217,981	75.7	190,210	66.0
686	72.7	August	207,986	71.2	190,436	65.2	177,498	60.7
686	71.7	July	135,998	45.9	144,291	48.7	151,255	51.0
686	71.0	June	108,693	38.7	114,807	40.9	141,176	50.2
686	70.7	May	126,487	42.7	176,582	59.6	196,254	66.2
686	71.7	April	182,903	61.8	234,000	79.0	235,967	79.7
679	72.6	March	251,411	87.0	278,767	96.5	262,497	90.9
679	72.7	February	189,081	66.3	275,118	96.5	249,859	87.6
679	73.5	January	234,858	74.8	274,097	87.2	228,660	72.8
		1923						
674	69.8	December	349,446	132.5	155,229	58.8	188,600	71.5
674	69.0	November	165,491	58.9	188,144	67.0	199,836	71.1

Rail Orders Better Spread

Seasonal Curve Flattened by Winter Deliveries

A TENDENCY toward flattening of the seasonal curve was noted in the steel rail market during 1924. An unusually large percentage of the tonnage placed in the last half of the year for 1925 track work was ordered for fall and winter delivery. As a result, the peak in the spring will not be so pronounced. This point is of considerable importance as in some years rail mills have had great difficulty with spring deliveries due to concentration of demands.

While the steelmakers roll sheet bars and structural shapes on their rail mills during the summer and fall seasons after the year's rail program has been completed, a rail mill is primarily a one-purpose unit and such rolling of other products always is done at a penalty. Complete flattening of the rail curve would be desirable from the standpoint of steelmakers. But this is not expected ever to materialize thoroughly, since railroad systems of the North cannot lay track easily during cold weather. Much of the tendency to get away from seasonal work was noted in the South and Southwest where weather conditions are not so severe as in the North and East.

The principal change in specifications is the tendency toward longer rails. Where the rails formerly were supplied in 33-foot lengths, some roads have asked 39-foot lengths and are obtaining them. There have been requests for 45-foot lengths the steel companies have not yet been able to meet this demand. No increase in weight above 130 pounds has developed, but there is a greater

tendency to increase rail weights toward that figure, especially in the North.

In volume of rail business, 1924 was only fair. The year's requirements had been practically all rolled by June. Production was resumed in the last quarter on the 1925 program. Indications are that 1925 will be a much better year.

Domestic rail prices during 1924 continued $43, base mill, per gross ton, which is equivalent to 1.92 cents per pound. This price also applies to the 1925 sales. Prices on rails for export varied but European makers uniformly were below American. The lowest American price on standard rails for Japan in the last quarter was around $39 per gross ton, c.i.f. Japan, while European mills took the business around $35.

Track fastenings paralleled rail activity. Prices eased off until October and then strengthened. Standard spikes were 3.15c base Pittsburgh in January, 2.70c in October and 2.80c in December.

Light rails enjoyed only a fair year. Competition of rerollers was keen and these interests sometimes went $3 to $4 a ton below the market on billet rolled rails.

Light Rail Prices by Quarter, 1915-1924

Per Pound and Per Gross Ton

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
Jan. 1	1.07c	1.55c	$50.00	3.00c	2.75c	2.45c	3.00c	1.50c	2.15c	2.10c
April 1 ...	1.07c	2.10c	55.00	3.0c	2.45c	3.25c	2.50c	1.60c	2.25c	1.95c
July 1	1.07c	$47.00	$70-$80	3.00c	2.45c	3.75c	2.20c	1.75c	2.25c	1.90c
Oct. 1 ...	1.25c	47.00	75.00	3.00c	2.45c	3.50c	1.65c	2.15c	2.15c	1.80c

Foreign Alloys Come In

New Sources Ship Metals to United States

MUCH of brighter conditions was reflected in ferromanganese at the close of 1924 than at the beginning. The trend is shown by prices. Sales at the beginning of the year were made at $109 and $110, duty paid tidewater. The market sagged off by easy stages until during August the prices obtained, deducting the duty, and allowing for differences in the cost of the ore, were the lowest in a decade. The lowest price was $90. The market immediately recovered and in December was firm at $105.

Imports and Domestic Production of Manganese Alloys—Imports of Manganese Ore

In Gross Tons

	Production		Imports		
	Ferro-manganese	Spiegel-eisen	Ferro-manganese	Spiegel-eisen	Imports Manganese ore
1924*	191,731	110,338	†39,600	.....	‡238,567
1923	242,450	123,148	91,066	4,668	‡206,048
1922	150,039	68,589	95,007	8,157	374,451
1921	100,694	55,042	9,057	307	401,000
1920	286,365	110,685	59,254	5,234	601,437
1919	175,009	84,014	33,022	27	333,344
1918	325,133	303,535	27,168	.....	491,303
1917	328,000	187,000	51,800	.....	663,500
1916	275,204	187,233	90,928	.....	576,321
1915	144,260	114,556	55,263	200	313,985
1914	100,731	76,625	82,997	2,870	283,294
1913	119,495	106,980	128,070	77	345,090
1912	125,378	102,561	99,137	1,015	300,661
1911	74,602	104,013	80,263	20,970	176,852
1910	71,376	153,055	114,228	25,383	242,348
1909	82,209	142,831	88,934	16,921	212,765
1908	40,642	111,376	44,624	4,579	178,203
1907	55,918	283,430	87,400	48,994	209,021
1906	55,520	244,980	84,359	103,268	221,260
1905	62,186	227,797	52,841	55,457	257,033

*Estimated. †Includes Spiegeleisen ‡Manganese content.

One of the year's interesting developments was the entrance of Norway as a source of ferromanganese to the American trade. The first cargo was received at Philadelphia in May. This metal was made in electric furnaces at the new plant of the Electric Furnace Products Co. at Ryfylke, Norway, for the Electro Metallurgical Co., New York, both of which companies are subsidiaries of the Union Carbide & Carbon Corp. In August, large additional tonnages of this Norwegian metal were sold in the United States.

During the latter part of the year some German ferromanganese was sold in this country but only on a small scale. Offerings of Indian ferromanganese were made at various times but apparently no sales resulted. Indications are that the domestic and English makers will continue the chief sources for the American market, with the new Norwegian plant an important potential factor. Incidentally, during the year the British ferromanganese syndicate suffered the withdrawal of one of its most important members, but this action had no appreciable effect on market developments in the United States.

Spiegeleisen consumption has increased somewhat since the high duty was placed on ferromanganese, but not sufficient to make any noticeable difference in the market. Market developments in spiegeleisen largely paralleled those in ferromanganese. There was some competition from English makers and at one time this competition forced a considerable drop in American prices. But the important bulk of the trading in the market was in Caucasian ore, of which the imports were large. Heavy sales have been made for shipment next year. In view of the importance of Caucasian ore, developments in the Caucasus are being observed with close attention. In October it was reported that W. A. Harriman & Co., New York, had made an arrangement with the Russian soviet government for the Caucasian manganese ore production, but this matter apparently is not yet settled. Ferrosilicon and ferrochrome are bought almost exclusively under contracts entered into in December and extending over the ensuing year. The 1924 contract price for 10 per cent was $75 delivered; for 1925 the contract price has advanced to $82.50; the 1924 contract price for 75 per cent ferrosilicon was $130, delivered; this advanced to $145 for 1925; the 1924 price for 14 to 16 per cent ferrosilicon ranged between $36 and $40 furnace; contracts for 1925 have been made at $42.

Ferrochrome contracts were made for 1924 at 10 to 10.75 cents for the 4 to 6 per cent carbon grade. For the current year contracts have been made at 11.50 cents, pound contained metal, delivered.

Vanadium prices were steady through the year, ranging between $3.25 and $3.75 a pound contained, according to quantity and analysis. Business showed much improvement over the year. The leading producer has resumed production in its Peruvian properties after shutdown of over two years.

World Politics Ruled Metals

Dawes Plan and London Conference Clears Foreign Atmosphere —American Election Big Factor in Restraining and Then Stimulating Buying—Many Deterring Influences Lifted and Industry Closes Year on Better Basis

AMERICAN nonferrous metal industries are entering 1925 under more auspicious conditions than have existed at the start of any year since the war. Two dark clouds which overshadowed the world metal markets in 1924 have been dissipated and the buying policies of consumers and selling policies of producers at the end of 1924 have reflected the rebirth of confidence.

During 1924 the metal markets were influenced by the political and economic situation in Europe and by the political situation in the United States. The work of the Dawes commission, followed by the London conference, was accompanied by fluctuating prices as sentiment shifted over the prospect for European rehabilitation. In July, after the allied powers reached a successful conclusion at London, the markets enjoyed an enthusiastic but short recovery. This movement was brought to a halt by anxiety over the LaFollette campaign and danger of the election being thrown into congress. Toward autumn, this fear decreased, but manufacturers and buyers generally were prone to play safe, postponing all but "must" purchases until after election. Just before Nov. 4, however, a broad buying movement took place in all metals, as results of the election were obvious. For a month buying continued, with accompanying rise in price for all principal metals. Contracts were placed in most lines for first quarter delivery and in some lines for first half. Buyers were encouraged by the changed political outlook abroad and here to make definite purchases against definite production requirements for some months ahead.

This is the situation at the end of 1924. The year as a whole has seen American production and consumption at about the same average rate as in 1923. Prices have been low in most lines, with business on a narrow margin of profit. Competition has been keen, due to the continued existence of excess capacity provided during the war. Yet the growing needs of Europe made clear the last half of 1924 promised to take up more of the excess capacity and assist American metal industries to a greater profit in 1925 than in 1924.

Copper—Electrolytic copper sold from a low of 12.50c, delivered Connecticut, reached several times during the year, up to 14.25c as December began. Consumption by American consumers continued at a record rate, electrical and building trades using a heavy tonnage. Extension work by public utility companies was probably the largest single outlet for copper. Exports expanded to a rate greater than ever attained except in 1917, the average for the first 10 months reaching about 87,000,000 pounds monthly. Production by American mines was reduced somewhat by autumn so that in the last few months production and consumption have been well balanced.

Zinc—Prime western slab zinc swung between 7.10c, East St. Louis, in March and 6.65c in May and back up to 7.10c early in December. American production averaged 44,500 tons monthly, which was about 5,000 tons a month more than American deliveries, the surplus being taken up by exports. The feature of the year's market was the expansion in European demand for American zinc, which averaged about 5,000 tons most of the year but expanded to about 10,000 tons toward the close.

Lead—Lead enjoyed a strong market most of the year, with prices about 100 per cent above prewar average. European demand took up all Mexican production after mid-year, and domestic production was the sole source of supply. The market became so strong late in the year that the two largest companies kept the market in check by alloting a specified tonnage each day to regular customers, at prices ¼ to ½c below the open market.

Tin—Absorption of practically all the 17,000 tons of Straits tin held in the Bandoeng pool in 1923 relieved the tin market of these invisible supplies which had overshadowed the trade for several years and left only about 20,000 tons of world visible supplies at the end of the year. Prices discounted the reduction in supplies by rising to the high level for the year above 55c, early in December.

Antimony—Antimony prices rose to a new high postwar level of 15c, duty paid, due to the civil war in China which interfered with production.

Aluminum—The domestic producer quoted 27c for 98 to 99 per cent virgin ingot aluminum all through 1924, this being the price also maintained by importing agencies and quoted on outside lots practically at all times.

Rolled products—Brass and copper products, like the raw metals, began the year in a strong market, later became depressed, and then in the late autumn became decidedly strong again. Goods such as sheets, tubes, rods and wire, were selling in December at approximately the same prices as at the peak of business last March, but in some instances the differentials of finished mill products over raw materials had not been restored to quite the figures of last winter. In the early part of December buyers pretty well covered their needs for the first quarter and mill operations again were at a high percentage. Public utility buying on account of the electric expansion of the country, was a big feature of the mill situation in the past year, especially in copper wire. Some mills turning out the latter product remained near 80 per cent of capacity when other kinds of mills were low, and few of the wire mills went much under this figure, though considerable new capacity was added during the year.

Average Monthly Nonferrous Prices in 1924

Prompt, wholesale lots, cents per pound

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Tin, spot straits, New York	$48.76	$53.453	$54.99	$54.990	$44.112	$42.66	$44.112	$52.342	$49.100	$50.578	$54.256	.....
Electrolytic copper, delivered	12.77	13.013	13.841	13.841	13.057	12.623	13.057	13.511	13.196	13.165	13.878	.....
Lead, New York, outside	8.25	9.214	9.341	9.341	7.307	7.078	7.307	8.021	8.041	8.386	9.083	.....
Zinc, prime Western, East St. Louis	6.428	6.774	6.49	6.490	5.83	5.79	5.788	6.179	6.19	6.328	6.794	.....
Aluminum, outside 98-99%	26.50	27.00	27.00	27.00	27.00	26.66	27.00	27.00	27.00	27.00	27.00	.....
Antimony, spot	7.90	10.802	11.55	11.490	8.55	8.343	8.50	9.62	10.958	14.401	14.151	.....

Market History Told by Prices
Ores and Alloys

Per Gross Ton

Spiegeleisen, 1915-1924

At Producers' Furnaces

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$39.00	$39.00	$38.00	$36.00	$36.75	$36.00	$35.00	$32.50	$32.00	$31.00	$31.75	$31.00
1923.....	34.90	35.75	37.25	39.25	43.00	46.00	45.00	45.00	43.50	40.00	39.00	38.00
1922.....	25.50	28.00	28.00	30.00	35.00	35.25	35.00	37.00	38.00	37.75	36.80	35.50
1921.....	46.25	37.75	34.20	32.00	31.75	29.60	27.50	26.20	25.25	24.85	25.00	25.00
1920.....	46.60	57.60	60.40	66.85	75.00	75.00	75.00	79.35	82.00	80.00	74.35	57.90
1919.....	*67.50	*52.50	*42.50	*34.50	*31.35	*27.50	34.00	34.00	34.00	34.00	34.00	39.00
1918.....	59.00	59.00	65.50	*70.00	*71.00	*75.00	*75.00	*75.00	*75.00	*75.00	*75.00	*72.50
1917.....	57.50	66.25	77.50	76.75	78.00	83.00	85.00	81.25	80.50	73.50	63.25	60.00
1916.....	32.50	42.50	55.00	60.00	60.00	55.00	47.50	47.50	45.00	40.00	45.00	50.00
1915.....	25.00	25.50	26.00	26.00	26.00	26.00	26.00	26.00	29.00	30.00	30.00	30.00

* Prices from and including April, 1918, and to and including June, 1919, are for 16 per cent spiegeleisen. All other prices apply to 20 per cent metal.

Ferrosilicon, 10 Per Cent, 1916-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$41.50	$42.50	$42.25	$41.50	$40.30	$39.50	$39.50	$39.50	$39.50	$39.50	$39.50	$39.50
1923.....	44.50	45.50	47.10	48.50	48.50	48.00	46.50	43.50	43.50	43.50	41.50	41.50
1922.....	38.50	37.50	36.50	37.25	40.50	41.50	41.50	42.50	48.50	50.00	48.00	44.50
1921.....	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	52.50	57.50
1920.....	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50	82.50
1919.....	54.00	54.00	52.95	47.40	45.00	47.40	49.75	49.75	49.75	49.75	54.75	58.50
1918.....	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	57.00	57.00	57.00
1917.....	42.00	42.00	49.80	57.00	67.00	82.50	92.25	95.00	95.00	80.00	55.00	55.00
1916.....	28.00	28.00	31.00	31.00	32.00	32.00	32.00	31.80	30.25	30.50	34.60	42.00

Ferrosilicon, 50 Per Cent, 1916-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$75.00	$75.00	$75.00	$75.00	$75.00	$75.00	$74.50	$74.50	$74.50	$75.00	$75.00	$82.50
1923.....	85.00	90.00	92.50	95.00	95.00	87.50	82.50	82.50	82.50	82.50	80.00	75.00
1922.....	57.50	55.00	54.00	55.00	57.50	57.50	55.00	55.00	55.00	70.00	82.50	82.50
1921.....	80.00	92.00	93.00	90.00	80.00	75.00	75.00	65.00	65.00	60.00	60.00	57.00
1920.....	82.00	80.00	83.00	80.00	83.00	82.50	82.50	80.00	82.50	82.50	80.00	80.00
1919.....	145.00	125.00	115.00	110.00	100.00	85.00	80.00	78.00	80.00	85.00	80.00	80.00
1918.....	175.00	175.00	177.50	172.50	170.00	170.00	165.00	153.50	150.00	151.00	150.00	150.00
1917.....	122.50	156.25	175.00	187.50	230.00	230.00	237.50	225.00	212.50	171.25	157.50	172.50
1916.....	83.00	83.00	83.00	83.00	83.00	83.00	83.00	83.00	83.00	94.25	95.00	95.00

Ferrochrome, 4-6 Per Cent, 1918-1924

Per Pound of Metallic Chromium Contained

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c	10.75c
1923.....	12.50	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
1922.....	14.50	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	13.00	13.50	13.50
1921.....	17.50	17.25	17.25	16.25	16.00	15.00	15.00	14.00	14.50	14.50	14.50	14.50
1920.....	22.50	19.50	19.50	19.50	18.50	18.50	21.50	20.00	18.50	18.50	18.50	18.50
1919.....	41.00	32.50	31.00	31.00	32.00	32.00	32.00	32.00	29.00	29.00	28.00	28.00
1918.....	.....	.....	.....	.....	.....	.....	44.00	41.00	41.00	41.00	41.00	41.00

Ferrotungsten, 1918-1924

Per Pound of Metallic Tungsten Contained

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$0.87	$0.86	$0.88	$0.90	$0.91	$0.90	$0.89	$0.87	$0.87	$0.87	$0.87	$0.87
1923.....	0.87	0.87	0.89	0.90	0.92	0.92	0.95	0.88	0.87	0.87	0.87	0.87
1922.....	0.42	0.37	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.85	0.92	0.92
1921.....	0.65	0.57	0.57	0.47	0.47	0.50	0.50	0.47	0.36	0.36	0.36	0.36
1920.....	1.05	1.05	1.00	1.00	1.05	1.07	1.12	1.10	1.10	0.95	0.95	0.95
1919.....	2.35	2.15	2.07	1.75	1.40	1.32	1.30	1.22	1.25	1.25	1.20	1.15
1918.....	1.95	2.72	1.98	2.32	2.26	2.23	2.25	2.32	2.32	2.55	2.65	2.45

Ferromanganese, Pittsburgh, 1914-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$113.79	$112.29	$112.29	$112.29	$112.29	$112.29	$110.79	$98.79	$97.79	$104.79	$107.29	$109.79
1923.....	109.79	112.29	120.79	124.79	129.79	129.79	122.29	122.29	114.79	112.79	113.79	113.79
1922.....	16.90	65.32	67.82	69.07	72.32	72.82	72.29	72.29	†80.59	105.47	104.92	104.92
1921.....	101.00	96.85	89.00	87.50	83.00	76.50	75.00	70.75	64.75	61.65	60.00	60.00
1920.....	146.00	160.00	172.00	200.00	200.00	198.00	190.00	193.75	172.40	156.40	153.00	120.00
1919.....	*212.50	165.00	134.00	113.75	110.00	111.75	111.00	110.00	105.00	110.00	110.00	121.00
1918.....	250.00	250.00	250.00	250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*250.00	*236.00
1917.....	175.00	192.50	212.50	250.00	375.00	400.00	400.00	387.50	380.00	300.00	247.50	242.50
**1916.....	139.88	215.13	334.75	412.50	347.75	244.88	198.75	173.18	167.67	160.00	155.00	162.50
1915.....	68.00	78.80	95.00	95.00	97.00	105.00	103.57	101.36	110.00	109.64	100.42	103.04
1914.....	43.57	39.01	39.02	38.68	38.16	38.00	37.54	102.08	93.45	70.80	67.85	68.00

* Prices from May, 1918, to January, 1919, inclusive, were based on 70 per cent ferromanganese. All other prices in above table were based on 80 per cent metal.

† Duty of 1¾ cents per pound contained manganese became effective on ferromanganese Sept. 21.

** Quotations seaboard to Jan., 1917, delivered Pittsburgh thereafter.

Market History—

Manganese Ore, 1915-1924

Dollars Per Gross Ton. 50 Per Cent Ore

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$31.20	$32.70	$23.20	$32.20	$32.20	$31.70	$30.70	$30.20	$30.20	$30.20	$31.70	$32.20
1923.....	29.45	29.45	31.70	33.20	32.70	32.95	32.95	32.95	31.70	31.70	31.70	31.70
1922.....	10.50	11.00	12.50	12.75	12.75	13.25	13.50	13.75	*14.35	25.50	25.50	25.50
1921.....	18.75	17.50	17.25	14.00	14.00	12.50	12.50	12.50	12.50	12.50	12.50	12.00
1920.....	30.00	38.75	38.75	32.25	35.00	37.50	42.25	35.00	35.00	32.75	25.00	21.25
1919.....	55.50	38.75	37.50	30.00	30.00	30.00	31.25	31.25	30.00	27.50	27.50	27.50
1918.....	63.75	63.75	60.00	65.00	65.00	65.00	68.50	65.00	65.00	65.00	62.50	55.00
1917.....	30.00	30.00	40.00	40.00	50.00	50.00	50.00	50.00	60.00	60.00	60.00	60.00
1916.....	22.50	22.50	22.50	22.50	22.50	22.50	22.50	22.50	30.00	30.00	30.00	30.00
1915.....	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	22.50	22.50	22.50	22.50

* After Sept., 1922, duty 1c per pound metallic content, $11.20 per gross ton 50 per cent ore.

Pig Iron

Per Gross Ton

Basic, Pittsburgh, 1902-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$23.16	$23.76	$23.46	$23.46	$22.46	$21.76	$20.76	$20.76	$20.76	$20.76	$21.01	$22.26
1923.....	27.67	27.87	31.57	32.77	31.57	29.12	26.92	26.77	26.77	25.52	22.57	22.77
1922.....	20.31	19.81	19.86	22.21	26.46	26.96	26.76	27.96	34.27	32.37	29.77	26.77
1921.....	31.46	28.71	26.56	24.81	23.96	23.16	20.81	20.96	21.56	21.16	20.96	20.71
1920.....	39.20	43.65	44.40	44.40	44.65	45.15	47.40	49.40	50.45	47.21	39.46	34.96
1919.....	31.00	31.40	30.35	27.15	27.15	27.15	27.15	27.15	27.15	27.15	30.40	35.40
1918.....	33.95	33.95	33.95	32.95	32.95	33.20	33.40	33.40	33.40	34.40	34.40	34.40
1917.....	30.95	30.95	32.85	39.20	42.14	50.20	53.20	52.75	43.95	33.95	33.95	33.95
1916.....	19.20	18.77	19.20	19.20	18.95	18.95	18.95	18.95	19.08	20.83	25.95	30.95
1915.....	13.45	13.45	13.45	13.45	13.45	13.54	13.83	14.89	15.65	15.95	16.70	18.55
1914.....	13.42	14.09	13.96	13.90	13.90	13.90	13.90	13.90	13.90	13.75	13.45	13.45
1913.....	17.40	17.29	17.03	16.77	16.15	15.46	15.25	15.07	15.09	14.85	14.09	13.65
1912.....	13.28	13.30	13.44	14.00	13.00	13.40	14.40	14.85	15.33	16.95	17.12	17.40
1911.....	14.40	14.46	14.46	14.46	14.32	14.12	13.77	13.90	13.70	13.42	13.37	13.26
1910.....	17.90	17.77	17.20	16.65	16.20	15.70	15.27	14.95	14.70	13.96	14.28	14.20
1909.....	16.75	16.50	16.00	15.75	15.00	15.50	15.75	17.00	18.00	18.50	18.50	18.75
1908.....	17.25	16.90	16.90	16.50	16.40	16.25	16.00	15.90	15.50	15.10	16.40	16.40
1907.....	23.05	22.85	22.85	22.85	23.65	24.15	23.25	22.20	21.40	20.65	19.25	18.40
1906.....	18.20	17.95	17.85	17.85	17.85	17.85	17.95	18.40	18.95	20.70	22.20	22.85
1905.....	16.75	16.35	16.15	16.10	16.10	15.55	14.90	15.20	15.75	16.20	17.85	18.10
1904.....	13.70	13.35	13.75	13.95	13.35	12.50	12.20	12.60	12.50	12.90	14.80	20.40
1903.....	21.80	22.10	21.95	21.45	20.20	20.00	19.40	16.20	16.85	15.95	15.00	13.95
1902.....	20.60	17.00	17.35	18.35	16.60	21.50	21.45	21.45	21.50	21.55	21.75	21.75

Bessemer, Pittsburgh, 1895-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$24.66	$25.01	$24.86	$24.61	$24.06	$23.26	$21.66	$21.76	$21.76	$21.76	$22.11	$23.26
1923.....	29.27	29.57	31.67	32.77	32.07	30.27	28.52	28.07	28.27	27.27	25.47	24.27
1922.....	21.51	21.31	21.21	22.46	26.46	26.96	26.76	29.16	35.27	35.12	27.77	30.33
1921.....	33.96	30.96	28.96	27.46	26.06	25.06	22.96	21.96	22.46	22.06	21.96	21.96
1920.....	40.00	43.15	43.40	43.50	43.90	44.25	46.80	49.50	50.45	50.17	42.33	36.96
1919.....	33.60	33.60	32.55	29.35	29.35	29.35	29.35	29.35	29.35	29.35	32.00	36.65
1918.....	37.25	37.25	37.25	36.15	36.15	36.40	36.60	36.60	36.60	36.60	36.60	36.60
1917.....	35.95	35.95	37.45	42.20	44.95	55.20	57.95	55.55	48.27	37.25	37.25	37.25
1916.....	21.32	21.45	21.55	21.95	21.95	21.95	21.95	21.95	22.20	24.33	30.35	35.95
1915.....	14.70	14.63	14.55	14.55	14.55	14.58	14.88	15.89	16.80	16.95	17.45	19.70
1914.....	15.00	15.09	15.15	14.90	14.90	14.90	14.90	14.90	14.90	14.85	14.70	14.70
1913.....	18.15	18.15	18.15	17.90	17.90	17.26	16.65	16.52	16.65	16.60	16.09	15.90
1912.....	15.15	15.00	15.02	15.15	15.15	15.15	15.15	15.43	15.93	17.75	18.05	18.15
1911.....	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.90	15.39	15.10	15.15
1910.....	19.90	19.42	18.90	18.15	17.09	16.73	16.40	16.21	15.90	15.90	15.90	15.90
1909.....	17.34	16.78	16.34	15.80	15.48	16.13	16.37	17.13	18.33	19.68	19.80	19.90
1908.....	19.00	17.90	17.86	17.49	16.92	16.90	16.73	16.11	15.90	15.48	16.74	17.40
1907.....	22.92	22.78	22.85	22.16	24.10	24.10	23.30	22.90	22.90	22.80	20.60	19.90
1906.....	17.32	17.29	17.26	17.25	17.24	17.38	17.57	17.96	18.44	20.06	21.96	22.75
1905.....	16.85	16.45	16.35	16.30	16.20	15.65	15.00	15.40	15.90	16.50	17.70	18.10
1904.....	13.60	13.35	13.85	14.10	13.60	12.60	12.50	12.65	12.75	13.35	15.25	16.60
1903.....	22.35	22.35	22.00	21.60	20.00	19.85	19.00	17.85	16.35	15.85	15.25	14.35
1902.....	16.70	16.93	17.56	18.37	20.95	21.25	22.00	21.75	21.75	21.95	22.25	22.12
1901.....	13.25	13.60	16.56	16.69	16.65	15.94	16.00	15.90	15.71	15.90	16.10	16.35
1900.....	24.90	24.90	24.90	24.90	24.90	19.75	18.00	16.05	14.00	13.25	13.65	13.55
1899.....	11.00	11.75	14.00	15.15	16.25	19.00	20.75	22.00	23.50	24.00	24.50	25.00
1898.....	9.90	10.15	10.40	10.50	10.50	10.40	10.35	10.40	10.40	10.30	10.20	10.65
1897.....	10.50	10.65	10.50	10.00	9.35	9.35	9.00	9.05	10.00	10.25	10.25	9.90
1896.....	12.30	12.80	12.00	13.15	12.75	12.40	12.20	11.45	11.25	11.50	12.30	11.40
1895.....	10.00	10.15	10.25	10.75	11.25	12.00	14.00	14.75	17.25	15.75	14.00	12.25

Malleable, Valley, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$22.00	$23.00	$22.50	$22.20	$21.30	$19.75	$19.00	$19.00	$19.50	$19.50	$19.75	$20.50
1923.....	27.25	27.25	29.20	31.00	30.20	28.25	25.50	24.70	24.60	23.25	20.40	22.00
1922.....	19.45	19.00	19.00	20.40	24.60	24.50	25.00	28.60	34.00	32.30	29.25	26.25
1921.....	32.25	28.75	26.40	24.90	23.75	22.60	20.40	20.00	20.40	20.20	20.00	20.00
1920.....	38.95	41.60	42.35	41.60	41.60	41.85	43.40	48.25	50.50	48.25	40.40	36.00
1919.....	31.50	31.50	30.45	27.25	27.25	27.25	27.25	27.25	27.25	27.75	31.75	36.40
1918.....	33.50	33.50	34.45	34.45	34.45	34.65	34.90	34.90	34.90	34.50	34.50	34.50
1917.....	31.00	33.50	36.00	39.00	42.70	50.10	53.00	54.00	49.60	34.25	33.50	33.50
1916.....	19.00	18.65	18.50	18.50	18.50	18.50	18.50	18.50	18.55	20.15	25.85	30.75
1915.....	12.75	12.75	12.85	12.50	12.50	12.50	12.65	13.75	14.50	14.60	15.50	17.90
1914.....	13.15	13.19	14.15	13.25	13.25	13.00	13.00	13.00	13.00	12.90	12.75	12.75
1913.....	17.25	17.20	16.75	15.75	14.85	14.40	14.15	14.00	14.05	14.25	13.85	13.50

Market History—

No. 2 Foundry, Valley, 1904-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$22.40	$23.00	$22.50	$21.75	$20.90	$19.50	$19.00	$19.25	$19.50	$19.50	$19.60	$20.50
1923.....	27.00	27.00	29.60	31.00	30.15	27.75	25.60	24.70	24.75	23.40	22.00	22.00
1922.....	20.05	19.20	19.20	20.55	23.95	24.20	24.20	31.00	35.25	31.85	28.40	25.00
1921.....	31.10	28.20	26.20	25.05	23.80	22.50	20.30	20.10	21.20	21.20	20.05	20.35
1920.....	40.90	42.40	43.40	44.20	45.40	45.40	46.40	49.65	50.95	48.95	42.95	37.20
1919.....	31.00	31.00	29.10	26.75	26.75	28.15	28.15	28.15	29.50	34.95	33.35	38.15
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	32.35	34.25	37.20	39.90	42.95	51.40	55.90	54.70	49.05	33.00	33.00	33.00
1916.....	18.90	18.75	18.75	18.90	18.70	18.50	18.50	18.50	18.65	20.75	26.10	31.30
1915.....	13.25	13.25	13.25	12.95	12.75	12.75	12.85	13.95	14.75	14.85	15.90	17.50
1914.....	12.89	13.25	13.40	13.50	13.50	13.50	13.50	13.30	13.25	13.10	12.90	13.05
1913.....	17.50	17.30	16.75	15.80	14.80	14.15	13.85	13.80	14.00	13.90	13.90	13.50
1912.....	13.00	13.10	13.20	13.35	13.30	13.30	13.50	13.85	14.50	16.15	17.30	17.50
1911.....	13.75	13.75	13.85	13.85	14.75	13.60	13.50	13.50	13.50	13.50	13.15	12.80
1910.....	17.00	16.55	16.10	15.75	15.35	14.65	14.20	14.10	14.40	13.95	13.75	13.75
1909.....	15.35	15.00	14.85	14.25	14.35	14.85	15.25	15.35	16.25	17.10	17.25	17.25
1908.....	16.35	16.00	15.70	15.10	14.50	15.35	15.10	15.00	14.60	14.20	15.50	15.50
1907.....	23.30	24.00	24.00	24.00	24.50	24.50	23.15	22.55	21.30	20.05	19.15	17.05
1906.....	17.55	17.25	17.15	16.75	16.65	16.25	16.50	18.00	19.00	20.50	23.00	23.75
1905.....	16.50	16.15	16.00	16.15	15.75	14.35	14.35	14.55	14.75	15.65	16.85	17.25
1904.....	12.50	12.25	13.00	12.90	12.15	11.65	11.50	11.65	11.75	12.40	15.00	16.00

No. 2 Foundry, Chicago, 1895-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$23.70	$24.40	$24.50	$24.40	$22.80	$21.40	$19.80	$20.40	$20.50	$20.50	$21.00	$22.00
1923.....	28.80	29.75	31.25	32.50	32.50	31.25	28.00	27.10	26.75	25.60	23.30	23.00
1922.....	19.00	18.90	20.00	20.50	22.60	23.25	24.65	28.60	32.00	31.75	30.60	28.00
1921.....	32.75	28.65	25.80	24.25	23.00	21.10	19.15	19.60	21.75	21.50	21.00	20.00
1920.....	40.00	42.25	43.00	43.00	43.00	43.00	44.40	46.00	46.00	46.00	42.40	36.50
1919.....	31.00	31.00	29.95	26.75	26.75	26.75	26.75	26.75	26.75	31.75	31.75	38.30
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	30.00	31.25	35.70	39.25	43.20	51.00	55.00	55.00	49.50	33.00	33.00	33.00
1916.....	18.50	18.50	18.70	19.00	19.00	19.00	19.00	19.00	18.65	19.15	25.00	29.25
1915.....	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.40	13.80	14.45	17.10	18.00
1914.....	14.25	14.20	14.25	14.25	14.25	14.20	14.00	14.00	13.65	13.30	13.00	13.00
1913.....	18.00	18.00	17.60	17.25	16.70	16.10	15.20	15.00	15.00	15.00	15.00	14.50
1912.....	14.00	14.00	14.00	14.25	14.50	14.50	14.60	15.30	16.35	17.30	17.85	18.00
1911.....	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.50	14.50	14.50	14.00	14.00
1910.....	19.00	18.75	18.25	17.00	16.75	16.50	16.50	16.50	16.50	16.00	16.00	16.00
1909.....	17.45	16.75	16.50	16.45	16.20	16.40	16.90	17.35	18.20	18.85	19.00	19.00
1908.....	18.25	17.85	17.40	17.20	17.00	17.30	17.00	17.00	16.75	16.50	16.75	17.35
1907.....	26.00	26.50	26.75	27.50	27.40	26.50	25.40	24.50	23.60	22.60	20.60	19.00
1906.....	19.25	19.25	19.00	18.75	18.50	18.10	18.30	18.90	19.75	21.50	26.50	27.00
1905.....	17.50	17.50	17.50	17.50	17.25	16.60	16.15	16.35	16.50	17.55	18.90	19.50
1904.....	14.10	13.75	13.55	14.00	13.80	13.40	13.30	13.35	13.40	13.70	15.60	16.60
1903.....	25.00	24.00	24.00	23.00	21.70	20.50	18.50	17.50	16.85	15.90	14.50	14.30
1902.....	15.80	16.75	18.60	19.75	21.75	22.50	23.40	24.65	27.15	27.15	26.90	25.40
1901.....	14.60	14.10	15.20	15.50	15.50	15.50	15.50	15.20	15.00	15.00	15.00	15.50
1900.....	24.50	24.50	23.75	23.25	22.00	20.25	17.75	15.50	14.50	14.00	14.25	14.60
1899.....	11.25	12.00	14.25	15.00	15.25	17.00	17.00	20.00	22.00	23.00	23.50	24.50
1898.....	10.50	10.50	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
1897.....	11.00	10.75	10.75	10.75	10.25	10.00	10.00	10.00	10.25	10.75	10.75	10.50
1896.....	13.50	12.25	12.00	12.00	11.75	11.25	11.25	11.20	10.80	10.75	11.10	11.25
1895.....	9.75	9.75	9.75	10.00	10.25	10.75	12.50	13.50	13.50	14.50	14.50	14.00

Malleable, Chicago, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$23.70	$24.40	$24.50	$24.40	$22.80	$21.40	$19.80	$20.40	$20.50	$20.50	$21.00	$22.00
1923.....	28.80	29.75	31.25	32.50	32.50	31.25	28.00	27.10	26.75	25.60	23.30	23.00
1922.....	19.00	18.90	20.00	20.50	22.60	23.25	24.65	28.60	32.00	31.75	30.60	28.25
1921.....	33.25	29.00	26.25	24.75	23.50	21.20	19.15	19.40	21.75	21.20	21.00	20.00
1920.....	40.50	42.75	43.50	43.50	43.50	43.50	44.90	46.50	46.50	46.50	43.00	37.50
1919.....	31.50	31.50	30.45	27.25	27.25	27.25	27.25	27.25	27.25	28.00	32.25	38.80
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	34.50	34.50	34.50
1917.....	30.00	31.25	35.80	39.00	43.20	50.50	55.00	55.00	49.50	33.35	33.50	33.50
1916.....	19.00	19.00	19.00	19.50	19.50	19.50	19.50	19.50	19.15	19.50	25.00	29.25
1915.....	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.40	14.20	15.10	17.40	18.00
1914.....	14.25	14.25	14.25	14.25	14.25	14.25	14.00	14.00	13.50	13.50	13.00	13.00
1913.....	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	14.40

Southern No. 2, Birmingham, 1904-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$21.60	$23.00	$23.00	$22.20	$21.60	$20.00	$18.20	$17.90	$17.65	$17.50	$17.90	$19.50
1[illegible].....	23.30	24.50	26.50	27.00	27.00	26.75	25.00	23.60	22.75	20.20	19.25	21.00
1922.....	16.15	19.25	15.25	16.00	17.60	18.50	18.50	20.70	26.25	27.40	24.00	22.50
1921.....	33.75	27.70	25.10	23.00	22.50	21.70	20.25	19.00	19.00	19.00	18.25	17.00
1920.....	38.20	40.00	40.00	40.00	42.00	42.30	42.30	42.00	42.00	42.00	39.50	38.00
1919.....	31.00	31.00	30.00	26.75	26.25	25.25	25.00	26.75	26.75	27.45	30.65	35.15
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	35.25	35.25	35.25
1917.....	23.00	24.50	28.00	35.80	35.75	35.75	46.00	48.00	43.50	33.50	33.50	33.50
1916.....	14.50	14.65	15.00	15.00	15.00	14.45	14.00	13.60	14.40	15.15	19.60	23.00
1915.....	9.50	9.50	9.40	9.35	9.75	9.55	9.60	11.00	11.30	11.75	13.15	14.20
1914.....	10.50	10.50	10.60	10.50	10.50	10.45	10.05	10.00	10.00	10.00	9.90	9.50
1913.....	13.70	13.50	13.00	12.50	11.75	10.60	10.50	11.00	11.00	11.00	10.75	11.00
1912.....	10.00	10.00	10.05	10.50	10.95	11.00	11.25	11.65	12.50	13.45	13.75	13.50
1911.....	11.00	11.00	11.00	11.00	10.75	10.25	10.00	10.05	10.10	10.00	9.75	10.00
1910.....	14.00	13.90	13.00	12.10	11.80	11.60	11.40	11.00	11.00	11.00	11.00	11.00
1909.....	13.00	12.70	11.75	11.00	11.00	11.30	12.30	13.00	14.00	14.50	14.50	14.00
1908.....	12.80	12.50	12.10	11.90	11.50	12.00	11.60	12.05	12.50	12.50	12.50	13.00
1907.....	23.00	23.00	22.75	22.00	21.40	21.25	20.50	19.80	18.10	17.65	16.00	14.90
1906.....	14.00	14.00	13.70	13.65	13.75	13.50	13.00	14.15	16.00	17.15	21.25	22.00
1905.....	13.50	13.50	13.50	13.25	12.75	11.85	11.00	11.65	11.75	12.50	14.00	14.00
1904.....	9.75	9.50	9.70	10.00	9.65	9.15	9.15	9.50	9.50	10.65	12.75	13.05

Market History—

No. 2X Foundry, Philadelphia, 1910-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$24.26	$24.26	$24.13	$23.73	$22.60	$21.76	$21.76	$21.76	$21.26	$21.36	$22.98	$24.88
1923.....	29.56	30.10	32.00	32.75	32.75	30.60	28.00	25.80	26.20	24.50	23.00	24.26
1922.....	21.55	21.35	23.60	23.75	25.60	27.20	27.50	32.15	34.25	33.00	30.50	28.45
1921.....	35.00	31.00	27.40	26.25	26.10	26.00	23.50	21.00	21.40	22.00	22.50	22.10
1920.....	43.90	45.00	45.68	46.80	46.90	46.90	48.55	50.95	53.75	52.65	46.75	38.95
1919.....	36.15	36.15	35.10	31.00	30.10	29.60	29.50	29.60	29.95	32.00	35.85	40.75
1918.....	34.25	34.25	34.25	34.25	34.25	34.25	34.50	34.50	34.50	38.85	39.15	39.15
1917.....	30.50	31.75	36.90	41.75	43.35	47.50	54.35	53.40	47.80	34.00	34.00	34.00
1916.....	19.75	20.00	20.00	20.75	20.50	19.75	19.75	19.75	19.75	20.50	25.25	30.00
1915.....	14.25	14.25	14.25	14.25	14.00	14.25	14.50	15.25	16.25	16.50	17.50	19.25
1914.....	14.75	15.00	15.00	15.00	14.75	14.75	14.75	14.75	14.75	14.50	14.25	14.25
1913.....	18.25	18.00	17.75	17.50	17.00	16.25	15.50	15.75	16.00	15.75	15.50	15.00
1912.....	15.00	15.00	15.00	15.25	15.25	15.50	15.75	16.00	16.50	17.50	18.00	18.25
1911.....	15.50	15.50	15.75	15.50	15.25	15.00	15.00	15.00	15.00	15.00	14.85	14.75
1910.....	19.00	18.40	18.25	17.75	17.25	16.75	16.00	16.00	16.00	15.75	15.50	15.50

Basic, Eastern Pennsylvania, 1909-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$22.50	$22.50	$21.50	$21.35	$20.75	$20.60	$20.50	$20.00	$20.00	$20.00	$21.46	$22.50
1923.....	27.70	28.15	29.35	30.75	30.75	28.15	27.25	25.10	25.10	24.00	22.60	23.30
1922.....	20.25	19.85	19.90	21.70	24.55	25.25	26.00	29.50	30.00	30.25	28.00	27.65
1921.....	33.35	29.95	26.20	25.00	25.00	24.70	22.25	20.70	19.50	20.50	20.90	20.25
1920.....	39.75	40.50	43.00	43.70	44.00	44.05	44.10	47.45	51.15	50.75	44.55	34.75
1919.....	33.90	33.90	32.85	29.65	28.80	25.50	26.60	27.00	27.00	27.90	33.00	35.75
1918.....	33.90	33.90	33.90	32.90	32.90	32.90	32.90	32.90	32.90	36.60	36.90	36.90
1917.....	30.15	30.50	33.80	38.25	40.80	46.40	50.75	51.00	46.50	33.50	33.50	33.50
1916.....	19.50	19.50	20.00	20.50	20.00	19.25	19.00	19.25	20.00	21.00	25.50	30.50
1915.....	13.50	13.75	14.00	13.25	13.50	13.50	13.75	15.25	17.25	17.50	17.75	18.00
1914.....	14.00	14.25	14.25	14.25	14.00	14.00	14.00	14.00	14.00	14.00	13.50	13.50
1913.....	18.25	18.00	17.50	16.50	16.50	16.00	15.25	15.00	15.25	15.25	15.00	14.25
1912.....	14.25	14.25	14.25	15.00	15.00	15.25	15.50	16.25	16.50	17.50	18.00	18.25
1911.....	14.50	15.00	15.25	15.25	14.75	14.50	14.50	14.50	14.50	14.50	14.25	14.25
1910.....	18.75	18.50	18.00	17.50	16.25	15.75	15.50	15.00	15.00	14.50	14.50	14.50
1909.....	16.40	16.10	15.85	15.05	15.00	15.85	15.90	16.15	16.80	17.85	18.36	18.15

Standard Low Phosphorus, Eastern Pennsylvania, 1911-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$27.76	$27.76	$26.76	$26.86	$27.26	$27.26	$27.26	$26.26	$26.26	$26.26	$26.76	$29.79
1923.....	29.75	31.35	35.45	35.45	35.80	34.80	33.80	32.80	30.50	30.50	30.00	29.76
1922.....	35.00	34.00	34.00	34.00	35.35	35.35	35.15	38.00	40.00	40.00	40.00	40.00
1921.....	47.70	46.80	46.80	44.15	43.30	43.30	43.30	43.30	43.30	43.30	43.30	35.30
1920.....	51.60	53.55	53.80	53.80	54.80	60.20	57.80	59.60	65.30	65.30	*65.30	*65.30
1919.....	51.00	51.00	49.90	46.75	45.80	42.25	41.10	40.25	40.25	40.35	43.00	47.50
1918.....	55.50	55.50	55.50	55.50	55.50	55.50	56.00	56.00	56.00	57.00	57.00	57.00
1917.....	54.50	57.50	66.70	75.50	77.00	85.00	92.50	92.50	82.00	55.50	55.50	55.50
1916.....	32.00	32.00	32.00	33.00	34.00	34.00	33.00	33.00	34.00	40.00	46.00	55.00
1915.....	19.00	19.00	20.00	20.00	20.00	20.50	21.50	23.50	24.50	28.00	30.00	32.00
1914.....	21.00	21.00	21.00	21.00	21.00	20.50	20.50	21.00	21.00	21.00	19.00	19.00
1913.....	24.50	24.50	24.00	23.50	23.50	23.50	23.50	23.00	23.00	23.00	21.50	21.00
1912.....	19.25	19.00	19.00	19.50	19.75	19.75	20.00	21.00	21.50	22.50	24.00	24.50
1911.....	21.50	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.25	19.50	19.25

* Nominal.

Southern Ohio No. 2, Ironton, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$22.90	$24.00	$23.50	$23.00	$22.50	$20.25	$19.50	$19.75	$20.00	$20.00	$20.90	$22.00
1923.....	27.90	28.40	30.75	31.00	31.00	28.25	26.50	26.00	24.90	23.90	22.50	22.50
1922.....	19.60	19.15	19.00	20.30	22.70	23.25	24.15	27.00	33.75	32.40	29.25	27.00
1921.....	34.60	30.00	27.50	25.85	24.50	22.80	20.50	20.15	20.30	21.00	20.50	20.00
1920.....	39.50	43.00	43.25	43.25	44.00	44.00	44.00	46.50	46.80	46.00	44.00	37.25
1919.....	31.00	31.00	29.95	26.75	26.75	26.75	26.75	26.75	26.75	28.80	31.75	36.55
1918.....	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	33.00	34.00	34.00	34.00
1917.....	30.00	30.75	35.80	37.75	41.20	47.50	54.50	55.00	49.25	33.00	33.00	33.00
1916.....	18.30	18.50	18.30	18.50	18.50	18.15	18.45	18.40	18.15	19.40	24.00	30.00
1915.....	12.75	12.75	12.75	12.75	12.56	12.50	12.60	13.65	14.20	14.90	16.15	17.00
1914.....	13.00	13.00	13.25	13.50	13.50	13.50	13.00	13.50	13.00	13.00	12.65	12.65
1913.....	17.90	17.50	17.20	16.85	16.20	15.90	15.40	15.20	15.20	14.75	14.70	13.50

Lake Superior Charcoal, Chicago, 1907-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04	$29.04
1923.....	33.15	33.53	35.53	36.55	36.55	36.65	36.62	32.10	32.04	30.04	28.65	29.04
1922.....	31.50	30.50	26.90	26.50	28.40	30.00	31.65	33.75	36.15	36.15	36.15	36.15
1921.....	40.25	38.50	38.50	38.50	38.50	38.50	36.87	34.30	33.25	32.50	32.25	31.50
1920.....	48.75	55.65	57.50	57.50	57.50	57.50	57.50	57.50	58.30	58.50	58.50	53.50
1919.....	38.70	38.70	38.70	33.25	31.75	31.75	31.75	32.75	32.75	33.15	35.50	41.00
1918.....	37.50	37.50	37.50	37.50	37.50	37.50	37.70	37.70	37.70	37.70	38.70	38.70
1917.....	33.75	34.50	37.55	42.25	49.25	51.80	59.50	59.50	59.50	48.50	37.50	37.50
1916.....	19.25	19.50	19.75	19.75	19.75	19.75	19.75	19.75	19.75	20.35	21.95	31.75
1915.....	15.75	15.75	15.75	15.75	15.25	15.25	15.75	15.75	15.95	16.25	17.50	19.25
1914.....	15.50	15.50	15.50	15.50	15.75	15.75	15.75	15.75	15.75	15.75	15.75	15.75
1913.....	18.25	18.00	18.00	18.00	18.00	16.75	16.75	15.00	15.00	15.75	15.50	15.50
1912.....	16.50	16.50	16.50	15.50	15.75	15.75	16.25	16.75	17.75	18.75	18.75	18.75
1911.....	17.50	17.50	17.50	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	16.50
1910.....	19.50	19.50	19.00	19.00	19.00	18.50	18.50	18.50	18.50	18.00	18.00	17.50
1909.....	19.50	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70
1908.....	22.80	31.50	21.50	21.10	19.85	19.50	19.50	19.50	19.50	19.50	19.50	19.50
1907.....	25.50	26.75	25.50	26.00	27.10	27.40	27.10	27.00	26.75	26.10	25.25	23.50

Market History —

No. 2X Foundry, Buffalo, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$23.10	$22.75	$22.00	$21.50	$20.50	$19.90	$19.30	$19.10	$19.50	$19.60	$20.90	$22.00
1923.....	28.00	28.50	29.40	30.10	29.80	29.50	26.60	25.50	25.25	23.00	20.70	22.00
1922.....	19.80	19.15	18.30	20.75	23.00	23.85	25.35	31.50	33.75	31.50	27.85	26.00
1921.....	33.75	31.25	28.25	26.75	26.25	23.85	21.75	21.25	21.05	20.40	20.00	20.00
1920.....	41.50	44.60	45.15	46.25	46.25	46.25	46.25	48.75	51.25	51.25	46.00	48.25
1919.....	32.25	32.25	31.45	28.00	28.00	28.00	28.00	28.70	28.75	29.90	34.45	39.50
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	35.25	35.25	35.25
1917.....	35.00	35.00	38.15	40.00	42.75	49.15	53.50	54.00	49.05	33.50	33.50	33.50
1916.....	18.50	18.60	18.85	19.15	19.00	18.75	18.75	18.75	18.90	20.70	26.65	33.65
1915.....	13.15	13.05	12.55	12.75	12.75	12.75	12.80	13.70	15.15	15.80	16.70	18.00
1914.....	13.00	13.00	13.75	13.90	13.50	13.05	13.05	13.20	13.25	12.60	12.45	13.10
1913.....	17.25	17.00	17.00	16.50	15.50	14.75	14.00	14.00	14.25	14.00	14.00	14.00

No. 2X Virginia Furnace, 1911-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$25.00	$25.75	$26.00	$25.50	$25.50	$25.50	$24.50	$24.50	$24.50	$24.50	$24.50	$25.00
1923.....	27.50	27.50	28.25	29.25	28.60	28.00	27.25	26.25	25.50	25.00	25.00	24.50
1922.....	21.75	22.00	22.50	22.85	23.50	24.50	26.00	26.00	33.00	33.00	31.40	27.75
1921.....	34.50	31.25	28.05	27.10	27.00	26.00	24.50	24.00	23.00	23.25	22.80	22.50
1920.....	41.25	42.75	43.25	44.25	45.75	46.25	46.75	49.25	50.25	49.75	45.75	42.05
1919.....	35.25	33.00	31.55	28.45	27.50	26.50	26.50	28.25	29.25	30.35	33.40	38.25
1918.....	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	33.50	37.50	38.00	38.00
1917.....	26.50	28.25	34.25	38.30	41.00	46.50	52.25	51.90	46.50	33.50	33.50	33.50
1916.....	17.25	18.00	18.25	18.50	18.50	18.50	18.50	18.50	17.50	18.50	23.75	27.00
1915.....	12.50	12.50	12.50	12.50	12.50	12.50	12.50	13.00	13.50	14.00	15.50	17.00
1914.....	12.75	12.75	12.75	12.75	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
1913.....	16.00	15.50	15.50	15.00	14.50	13.75	13.00	13.00	13.00	13.00	13.00	12.75
1912.....	12.25	12.25	12.25	13.00	13.00	13.25	13.50	14.00	14.50	15.50	16.00	16.00
1911.....	12.75	12 75	13.00	13.00	13.00	12.25	12.25	12.25	12.25	12.25	12 25	12.25

Semifinished Material

Per Gross Ton

Bessemer Billets, Pittsburgh, 1895-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$40.00	$40.00	$40.00	$40.00	$39.20	$38.00	$38.00	$38.00	$37.10	$36.60	$35.50	$35.50
1923.....	37.50	38.85	44.50	46.00	45.00	42.90	42.50	42.50	42.50	41.50	41.50	40.00
1922.....	29.00	28.00	28.30	30.10	34.50	35.00	35.00	35.00	39.50	40.00	38.80	36.50
1921.....	43.50	41.00	38.50	37.75	37.00	37.00	32.25	30.00	29.80	30.00	29.00	29.00
1920.....	49.60	61.25	65.00	68.00	70.00	66.25	65.00	61.25	60.00	58.75	52.50	46.25
1919.....	43.50	43.50	42.25	38.50	38.50	38.00	37.30	38.00	38 50	39.30	40.85	45.00
1918.....	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50
1917.....	62.50	64.85	69.30	75.20	88.65	95.60	102.25	92.25	74.05	58.75	47.50	47.50
1916.....	34.05	35.50	41.10	46.25	46.10	43.00	42.50	45.15	47.50	48.10	53.10	59.50
1915.....	19.75	20.00	20.00	20.00	20.05	20.35	21.45	23.00	24.70	25.20	27.10	30.75
1914.....	20.00	20.90	21.05	21.05	20.00	19.80	19.55	20.05	21.00	20.40	19.25	18.85
1913.....	28.90	28.90	29.00	29.00	27.80	26.75	26.75	26.30	25.00	23.00	21.10	20.10
1912.....	20.00	20.00	19.90	20.00	21.10	21.90	22.25	22.40	23.75	25.70	26.75	27.00
1911.....	23.00	23.00	23.00	23.00	23.00	21.00	21.00	21.00	21.00	20.00	19.70	19.25
1910.....	27.87	27.50	27.50	27.00	26.10	25.50	25.00	25.00	24.50	23.40	23.00	23.00
1909.....	25.00	23.50	23.00	22.00	22.50	23.00	24.00	25.00	26.00	26.50	27.50	27.50
1908.....	28.00	28.00	28.00	28.00	28.00	26.50	25.00	25.00	25.00	25.00	25.00	25.00
1907.....	29.75	29.50	29.25	29.75	30.25	31.00	30.00	30.00	29.50	28.50	28.00	28.00
1906.....	27.00	27.50	27.65	27.75	27.00	26.25	27.00	28.00	28.50	28.50	29.00	29.75
1905.....	21.00	24.90	24.60	25.50	23.50	22.00	22.00	23.50	25.75	25.95	26.30	26.50
1904.....	23.00	23.00	23.00	23.00	22.00	21.50	21.00	20.00	19.50	19.50	21.00	21.00
1903.....	29.75	30.00	30.25	31.00	30.50	29.50	27.50	27.00	27.00	26.50	23.50	23.00
1902.....	28.05	29.80	31.35	32.25	33.90	35.20	33.50	32.10	31.50	29.80	29.00	29.25
1901.....	19.70	19.75	20.80	24.10	24.20	24.45	24.25	24.40	24.10	26.80	28.25	27.60
1900.....	35.00	35.00	35.00	34.50	29.00	27.25	22.50	18.00	17.50	17.50	19.30	19.75
1899.....	16.75	18.25	24.00	25.50	27.00	31.50	33.50	36.50	39.00	37.50	36.00	35.00
1898.....	15.00	15.00	15.25	15.25	14.85	14.75	14.75	15.45	16.10	15.75	15.25	16.00
1897.....	15.25	15.50	15.50	14.75	14.00	14.25	14.00	14.15	15.75	16.50	15.75	15.00
1896.....	17.05	17.65	17.50	18.90	19.50	19.75	19.90	19.75	19.60	20.25	20.00	17.00
1895.....	14.85	15.00	14.85	15.40	16.75	18.75	20.85	22.00	24.25	22.00	19.50	17.00

Open-hearth Billets, Pittsburgh, 1910-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$40.00	$40.00	$40.00	$40.00	$39.20	$38.00	$38.00	$38.00	$37.10	$36.60	$35.50	$35.50
1923.....	37.50	38.85	44.50	46.00	45.00	42.90	42.50	42.50	42.50	41.50	41.50	40.00
1922.....	29.00	28.00	28.30	30.10	34.50	35.00	35.00	35.00	39.50	40.00	38.80	36.50
1921.....	43.50	41.00	38.50	37.75	37.00	37.00	32.25	30.00	29.80	30.00	29.00	29.00
1920.....	49.60	61.25	66.25	70.00	70.00	66.25	65.00	61.25	60.00	58.75	52.50	46.25
1919.....	43.50	43.50	42.25	38.50	38.50	38.00	37.30	38.00	38.50	39.30	40.85	45.00
1918.....	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50	47.50
1917.....	60.00	62.50	67.00	72.50	85.00	93.75	100.00	93.00	73.75	58.75	47.50	47.50
1916.....	34.75	35.00	40.60	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	58.75
1915.....	19.50	19.50	19.50	19.50	19.50	19.85	21.50	24.00	25.60	26.50	28.00	30.20
1914.....	20.00	20.75	21.00	20.80	20.00	19.75	19.30	20.00	21.00	20.60	19.00	18.50
1913.....	28.70	29.40	29.50	29.50	28.10	26.50	26.50	26.10	25.00	23.00	20.85	20.00
1912.....	19.75	19.50	19.40	20.25	21.00	21.25	21.75	21.75	21.75	21.75	21.75	28.00
1911.....	23.00	23.00	23.00	23.00	22.00	21.00	21.00	21.00	20.25	19.50	19.75	19.25
1910.....	28.00	28.00	28.50	28.75	28.75	27.00	26.50	26.00	25.00	24.00	23.25	23.00

Market History—

Wire Rods, Pittsburgh, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$51.00	$51.00	$51.00	$51.00	$48.40	$48.00	$48.00	$46.00	$45.75	$45.00	$45.50	$48.00
1923.....	45.00	47.50	47.00	46.60	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
1922.....	37.00	35.75	35.80	38.00	38.00	38.00	39.50	40.00	45.00	45.00	46.50	46.50
1921.....	57.00	57.00	52.00	50.00	48.00	47.00	42.25	42.00	40.80	40.00	38.00	38.00
1920.....	52.00	56.00	62.50	70.00	70.00	70.00	70.00	70.00	70.00	75.00	72.50	57.00
1919.....	57.00	57.00	55.75	52.00	52.00	52.00	52.00	52.00	52.00	52.00	56.00	62.00
1918.....	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.25	57.50	57.50	57.50
1917.....	73.75	75.00	75.00	83.75	88.00	92.50	95.00	96.00	90.00	73.50	57.00	57.00
1916.....	46.25	50.00	51.00	55.00	60.00	60.00	58.75	55.00	55.00	55.00	64.00	69.00
1915.....	25.00	25.00	25.00	25.00	25.00	25.00	25.60	26.75	28.50	30.00	34.50	39.00
1914.....	25.50	25.90	26.00	26.00	26.00	25.50	24.80	24.50	25.60	26.00	25.75	25.00
1913.....	30.00	30.00	30.00	30.00	30.00	29.50	28.60	27.60	27.50	26.80	26.00	25.75

Open-hearth Sheet Bars, Pittsburgh, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$42.50	$42.50	$42.50	$42.10	$40.60	$40.00	$39.20	$38.00	$37.50	$37.20	$37.00	$37.00
1923.....	37.50	39.25	44.50	45.85	45.40	42.90	42.50	42.50	42.50	42.50	42.50	42.50
1922.....	30.00	29.00	29.40	31.50	35.00	35.00	35.00	35.00	39.50	39.85	38.80	36.50
1921.....	47.00	43.00	39.60	38.75	39.00	37.40	34.00	32.00	30.40	31.50	30.00	29.25
1920.....	53.40	65.00	72.50	78.00	78.75	75.00	75.00	71.25	68.50	63.75	56.25	47.65
1919.....	47.00	47.00	45.75	42.00	42.00	41.50	40.80	42.00	42.00	42.00	45.00	48.00
1918.....	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
1917.....	60.00	62.50	67.50	72.00	88.00	101.25	105.00	96.00	82.50	65.50	57.00	51.00
1916.....	34.75	35.00	41.00	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	59.00
1915.....	20.00	20.00	20.00	19.60	20.00	20.35	22.00	25.00	25.80	26.50	28.50	30.80
1914.....	20.60	21.75	22.00	21.60	21.00	20.75	20.20	21.00	22.00	21.60	19.60	19.00
1913.....	29.20	29.90	30.00	30.00	28.80	27.50	27.50	27.10	25.60	23.80	21.75	21.00

Bessemer Sheet Bars, Pittsburgh, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$42.50	$42.50	$42.50	$42.10	$40.60	$40.00	$39.20	$38.00	$37.50	$37.20	$37.00	$37.00
1923.....	37.50	39.25	44.50	45.85	45.40	42.90	42.50	42.50	42.50	42.50	42.50	42.50
1922.....	30.00	29.00	29.40	31.50	35.00	35.00	35.00	35.00	39.50	39.85	38.80	36.50
1921.....	47.00	43.00	39.60	38.75	39.00	37.40	34.00	32.00	30.40	31.50	30.00	29.25
1920.....	53.40	65.00	70.00	70.00	75.00	70.00	70.00	70.00	68.50	63.75	56.25	47.65
1919.....	47.00	47.00	45.75	42.00	42.00	41.50	40.80	42.00	42.00	42.00	45.00	48.00
1918.....	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00
1917.....	60.00	62.50	67.50	72.00	88.00	101.25	105.00	96.00	82.50	65.50	57.00	57.00
1916.....	33.75	34.00	41.00	45.00	44.25	41.20	40.00	43.60	45.00	45.75	52.00	59.00
1915.....	20.00	20.00	20.00	19.60	20.00	20.35	22.00	25.00	25.80	26.50	28.50	30.80
1914.....	21.00	22.00	22.00	21.60	21.00	20.75	20.20	21.00	22.00	21.60	19.60	19.00
1913.....	28.70	29.40	29.50	29.50	28.40	27.50	27.50	27.10	25.60	23.80	21.75	21.00

Beehive Coke

Per Net Ton

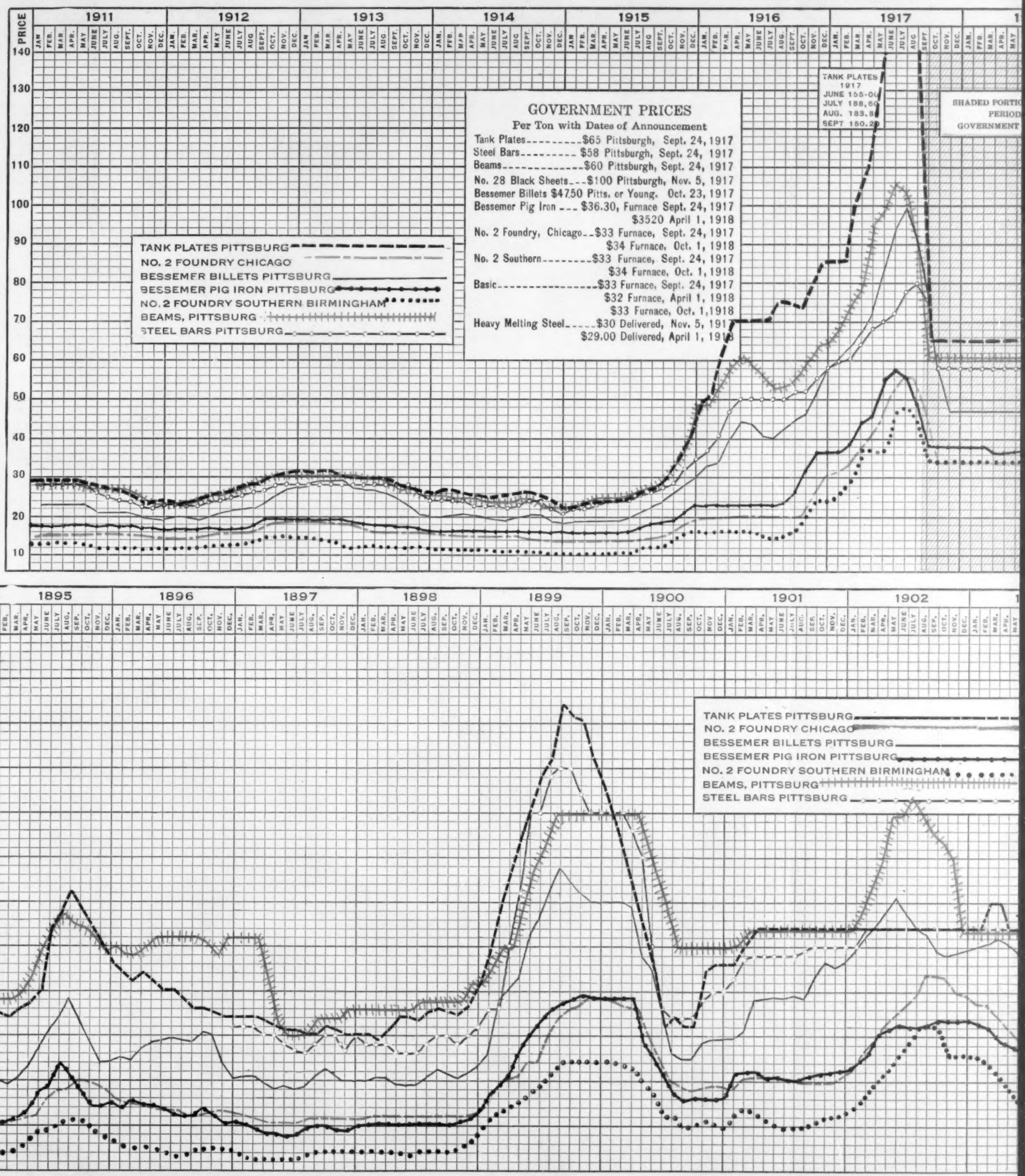
Foundry Spot, Connellsville, 1900-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$4.35	$4.80	$4.85	$4.60	$4.30	$4.15	$4.05	$4.00	$4.00	$4.00	$4.05	$4.25
1923.....	9.00	8.60	8.15	7.80	6.10	5.50	5.15	5.20	5.70	4.80	4.85	5.15
1922.....	3.85	3.80	4.05	4.95	6.50	7.20	11.40	14.30	12.75	12.10	8.40	7.50
1921.....	6.50	6.30	6.05	5.00	4.85	4.50	4.45	4.00	4.30	4.50	4.30	4.15
1920.....	7.00	7.00	7.00	11.60	12.50	15.00	16.00	18.25	17.90	16.85	9.40	7.25
1919.....	7.05	5.15	4.80	4.55	4.35	4.70	4.80	5.20	5.90	5.60	6.95	7.15
1918.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1917.....	10.40	10.90	11.30	9.65	9.65	11.20	15.00	12.70	13.35	7.00	7.00	7.00
1916.....	3.75	3.75	3.60	3.85	3.10	3.00	3.00	3.05	3.25	4.35	8.60	9.25
1915.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.05	2.25	2.30	2.95	3.15
1914.....	2.50	2.40	2.40	2.40	2.40	2.35	2.30	2.25	2.25	2.20	2.10	2.00
1913.....	4.45	3.70	3.50	3.05	2.90	2.85	2.85	2.85	2.85	2.75	2.50	2.50
1912.....	2.05	2.20	2.65	2.75	2.60	2.55	2.45	2.60	2.65	3.35	4.40	4.50
1911.....	1.95	1.95	2.00	2.00	1.90	1.75	1.80	1.85	1.85	1.85	1.90	1.90
1910.....	3.00	2.90	2.80	2.55	2.30	2.15	2.10	2.15	2.10	2.05	2.00	2.00
1909.....	1.70	1.60	1.55	1.50	1.45	1.50	1.50	1.65	2.30	2.75	2.80	2.75
1908.....	1.80	1.75	1.70	1.65	1.65	1.65	1.65	1.65	1.65	1.70	1.75	1.80
1907.....	3.75	3.55	3.00	2.70	2.15	2.05	2.40	2.60	2.80	2.90	2.40	2.00
1906.....	3.00	2.40	2.35	2.60	2.55	2.40	2.55	2.70	2.75	2.85	3.20	3.60
1905.....	2.80	2.50	2.50	2.00	1.90	1.85	1.80	1.85	2.00	2.70	3.00	2.85
1904.....	1.45	1.50	1.55	1.50	1.45	1.40	1.40	1.40	1.40	1.45	1.85	2.15
1903.....	4.50	4.50	4.00	3.75	3.50	3.00	2.50	2.00	2.00	1.90	1.90	1.75
1902.....	2.25	2.25	2.50	2.50	2.50	2.50	2.50	3.25	4.00	5.00	5.00	5.00
1901.....	1.75	1.75	2.00	2.00	2.00	1.85	1.75	1.75	1.75	2.00	2.00	2.00
1900.....	3.00	3.50	4.00	3.75	3.00	2.50	2.00	1.75	1.75	1.75	1.75	1.75

Furnace Spot, Connellsville, 1914-1924

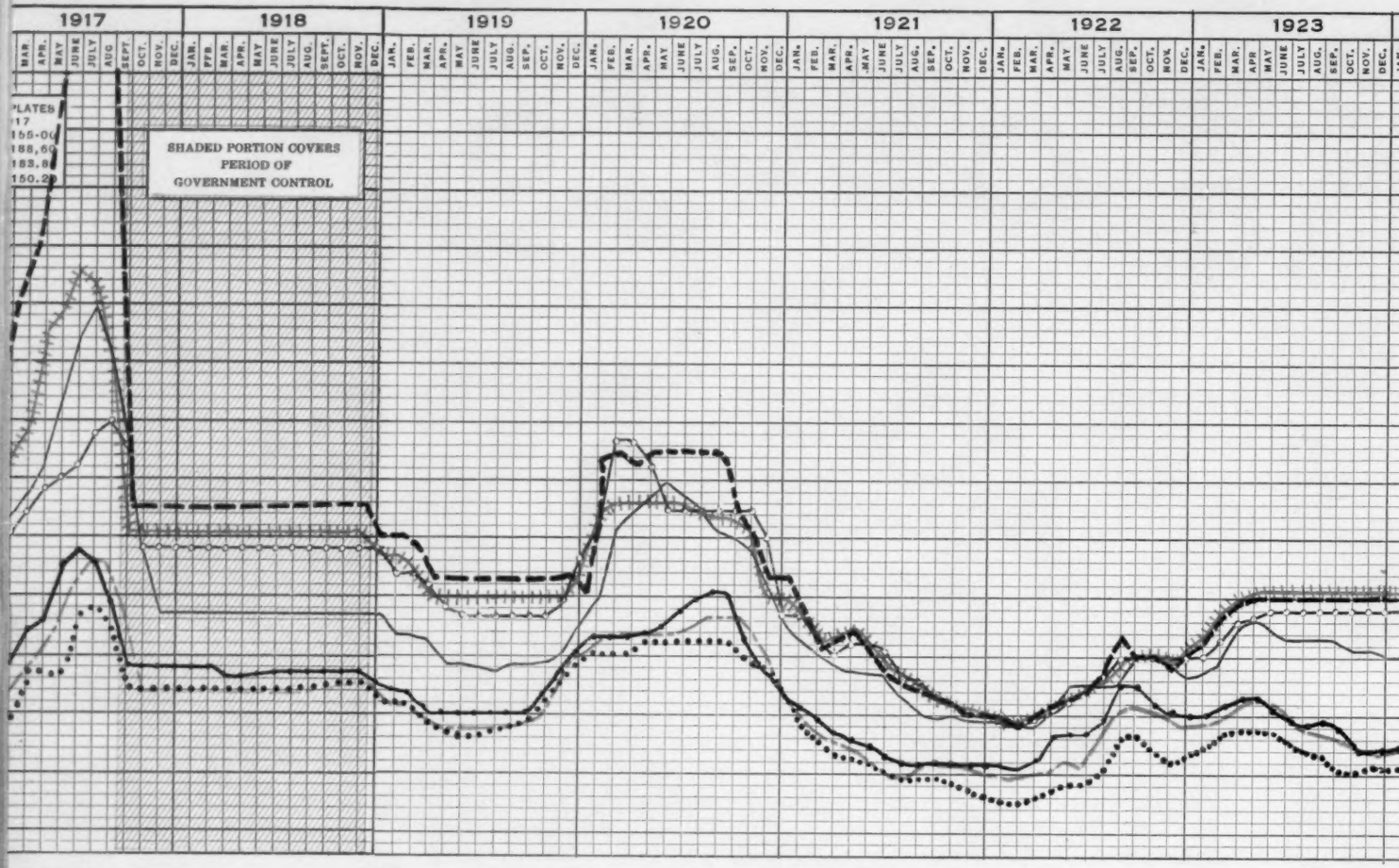
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$3.80	$4.00	$4.05	$3.55	$3.25	$3.15	$2.85	$3.00	$3.00	$3.00	$3.00	$3.35
1923.....	8.25	7.20	7.15	6.25	5.10	4.65	4.35	4.45	4.55	3.85	3.80	4.20
1922.....	2.75	2.95	3.25	4.30	6.00	6.60	10.65	13.20	11.00	10.60	7.10	6.25
1921.....	5.15	4.85	4.55	3.60	3.25	3.15	2.75	2.85	3.15	3.25	3.15	2.95
1920.....	6.00	6.00	6.00	11.20	12.00	14.50	15.20	17.75	16.90	15.15	8.40	6.25
1919.....	5.85	4.40	4.30	4.05	3.95	4.10	4.25	4.60	4.95	4.35	5.75	6.20
1918.....	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1917.....	9.05	11.20	9.40	7.60	8.35	11.40	12.10	13.70	12.10	6.00	6.00	6.00
1916.....	2.50	3.00	3.00	2.25	2.25	2.55	2.70	2.75	2.95	5.30	7.05	8.25
1915.....	1.60	1.55	1.50	1.50	1.55	1.55	1.70	1.50	1.60	1.70	2.10	2.10
1914.....	1.80	1.80	1.95	1.90	1.75	1.75	1.75	1.75	1.65	1.65	1.60	1.60

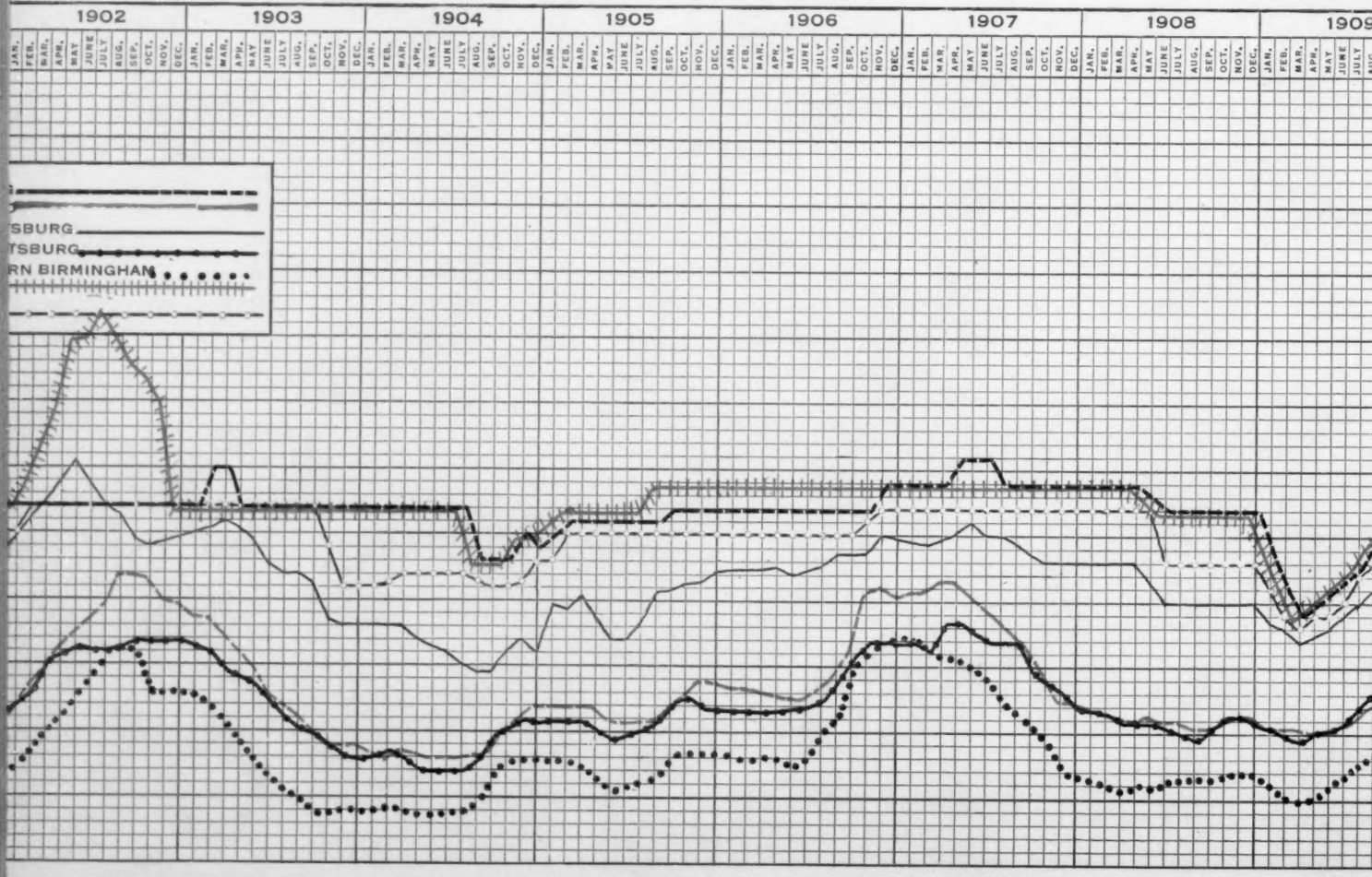
Finished Steel Products Given in Net Tons, Pig Iron and Billets in Gross Tons



ON TRADE REVIEW

Monthly Fluctuations of Iron and Steel Prices for a Period of Thirty Years





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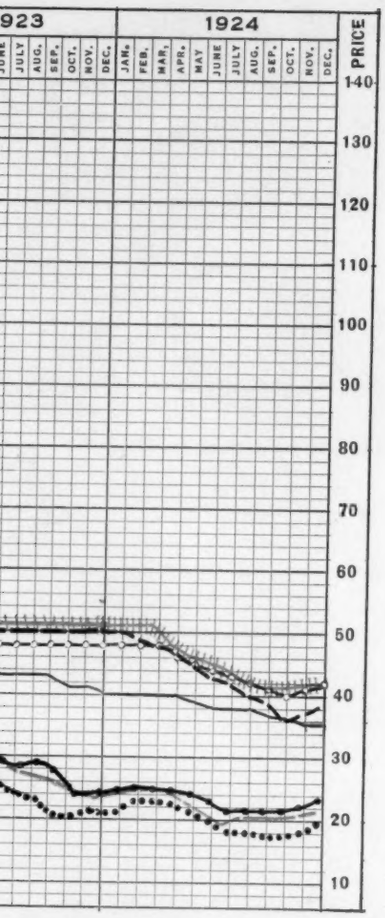
1923
1924
PRICE
JUNE
JULY
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SEP.
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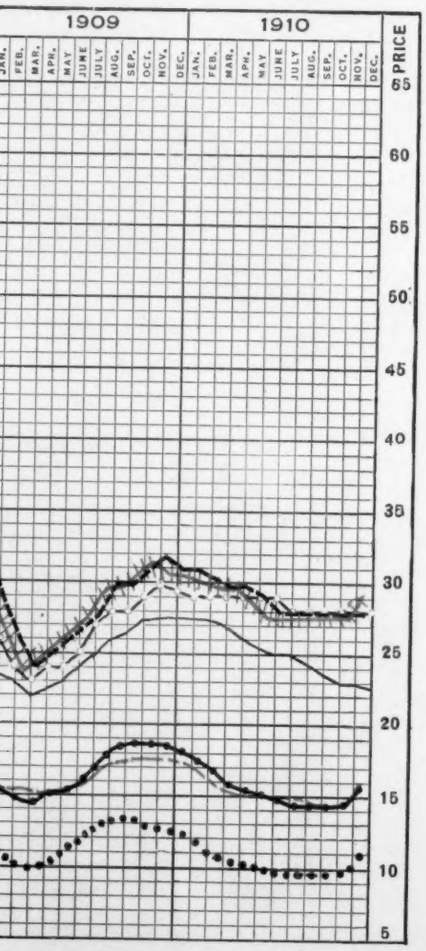
1909
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5

Market History—

Iron and Steel Scrap

Per Gross Ton

Heavy Melting Steel, Pittsburgh, 1902-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$21.10	$21.60	$19.75	$16.60	$15.40	$16.25	$17.30	$17.75	$18.60	$18.20	$19.85	$21.00
1923.....	21.65	23.40	26.10	25.85	22.50	20.50	18.25	17.50	18.00	16.10	15.70	18.50
1922.....	14.50	14.70	14.95	16.50	17.00	16.85	16.50	17.10	19.50	21.35	20.30	20.00
1921.....	15.00	15.00	15.00	13.00	13.60	13.10	12.00	12.60	11.30	14.00	14.25	14.25
1920.....	26.50	28.15	28.00	26.40	25.50	25.30	25.70	27.75	28.60	28.00	24.00	18.75
1919.....	20.80	17.00	14.60	15.75	15.55	17.25	19.90	21.25	20.50	20.00	21.90	24.65
1918.....	30.00	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00
1917.....	23.25	21.90	23.40	28.15	28.40	40.00	40.25	36.60	35.50	31.30	29.60	30.00
1916.....	17.50	17.35	17.95	18.10	17.10	16.25	16.25	16.00	16.10	17.80	20.55	26.75
1915.....	11.55	11.60	12.00	11.90	11.75	11.75	11.75	13.38	14.25	14.00	15.30	17.40
1914.....	11.30	12.15	12.40	12.25	12.00	12.00	12.00	11.65	11.65	11.40	10.40	10.45
1913.....	15.15	14.90	14.40	14.40	14.15	13.50	12.75	12.65	12.65	12.65	11.75	11.20
1912.....	12.50	12.65	12.40	13.00	13.40	13.40	13.65	13.55	13.90	14.40	15.30	15.00
1911.....	13.50	14.30	14.40	13.50	12.75	13.15	12.90	13.40	13.15	12.25	12.15	12.50
1910.....	17.90	17.65	17.00	17.00	16.00	15.25	14.50	14.25	14.25	14.40	14.15	13.75
1909.....	16.50	16.00	14.75	14.15	14.95	15.50	15.75	16.00	16.75	17.90	18.15	17.95
1908.....	13.25	13.25	13.50	12.75	12.75	13.00	13.25	14.75	14.75	14.50	14.75	16.25
1907.....	19.25	18.75	18.25	18.25	18.15	18.65	18.50	18.25	17.75	17.50	15.45	13.75
1906.....	17.75	16.65	15.90	14.65	15.25	15.00	15.75	16.00	16.90	16.75	17.25	19.75
1905.....	16.75	16.15	16.50	16.50	15.40	14.50	14.25	14.15	15.40	16.20	17.15	18.25
1904.....	12.65	13.25	13.75	14.15	13.05	11.50	10.75	11.15	11.75	12.00	13.65	14.90
1903.....	22.25	21.75	21.25	22.15	21.65	20.50	20.25	18.75	18.25	16.00	14.50	11.50
1902.....	17.25	17.45	18.55	19.40	20.25	21.40	22.25	21.25	21.25	21.65	21.15	22.25

Heavy Melting Steel, Chicago, 1909-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$17.40	$18.00	$16.70	$14.65	$13.75	$13.55	$14.75	$15.40	$16.40	$16.25	$17.05	$18.50
1923.....	18.70	19.75	23.15	22.40	19.75	17.75	17.10	16.25	16.55	14.50	13.80	16.00
1922.....	11.20	11.15	12.05	13.55	14.65	14.45	15.15	15.85	18.15	18.50	17.40	16.75
1921.....	15.25	15.25	12.55	11.25	11.50	11.20	10.55	10.70	11.30	12.55	12.40	11.00
1920.....	24.25	25.05	24.20	23.95	23.15	22.40	23.70	24.15	24.20	21.40	18.50	16.75
1919.....	19.20	14.90	15.25	16.40	15.40	16.75	19.40	20.75	19.00	18.80	20.65	21.25
1918.....	29.70	30.00	30.00	28.65	28.90	29.00	29.00	29.00	29.00	29.00	29.00	26.50
1917.....	20.25	21.65	23.00	26.65	28.70	37.00	35.50	33.10	32.65	27.00	28.50	28.90
1916.....	15.50	15.25	16.20	16.75	16.50	15.35	14.15	14.90	15.50	16.50	19.35	23.35
1915.....	8.90	9.45	9.75	9.30	9.25	9.40	10.15	11.50	12.00	11.55	13.15	15.40
1914.....	9.20	10.00	9.80	9.50	9.95	9.75	9.50	9.50	9.40	9.00	8.25	8.25
1913.....	12.75	12.50	12.50	12.50	12.00	12.00	12.00	12.00	12.00	12.00	9.00	9.00
1912.....	11.00	10.75	11.25	12.25	12.25	12.25	11.75	12.50	13.00	14.00	13.75	13.75
1911.....	11.50	12.00	12.00	11.50	10.25	10.25	10.25	10.75	10.50	10.00	9.75	9.75
1910.....	16.00	15.50	14.50	14.50	13.00	13.00	12.50	12.25	12.25	12.25	12.00	12.00
1909.....	14.00	13.40	12.15	12.90	13.50	14.15	14.05	14.95	15.80	16.30	15.75	15.50

Heavy Melting Steel, Eastern Pennsylvania, 1909-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$18.05	$18.95	$17.00	$15.25	$14.20	$15.00	$15.00	$16.50	$15.90	$16.50	$18.05	$19.00
1923.....	19.70	21.20	24.85	23.50	20.40	18.65	17.25	16.00	16.85	15.50	15.50	17.00
1922.....	11.75	12.25	13.15	14.35	15.15	15.30	15.00	15.25	17.10	18.00	16.70	16.00
1921.....	15.00	14.50	13.40	11.75	11.80	11.85	11.25	11.75	11.75	12.25	12.60	12.00
1920.....	24.25	25.75	25.55	24.30	23.60	22.40	22.00	24.10	26.40	23.80	20.30	16.90
1919.....	19.00	15.25	14.25	15.85	15.30	16.15	18.85	19.60	19.00	19.55	20.80	23.90
1918.....	29.80	30.00	29.50	28.30	28.50	28.50	28.50	28.50	28.50	28.50	28.00	25.00
1917.....	21.75	20.25	23.50	25.00	26.00	32.60	37.00	32.80	30.75	26.00	26.80	28.00
1916.....	15.50	14.95	16.15	16.80	16.35	15.35	13.95	15.40	16.65	17.50	21.25	26.00
1915.....	10.00	10.50	11.00	11.25	11.50	11.50	12.00	13.50	14.50	15.00	14.50	16.00
1914.....	10.50	11.25	11.50	11.00	10.75	10.75	10.50	10.75	10.75	9.75	9.50	9.50
1913.....	14.50	13.50	13.50	13.75	12.50	12.00	11.50	11.75	12.00	11.00	10.25	10.00
1912.....	12.25	12.00	12.25	13.00	13.75	13.50	13.75	14.25	14.75	15.50	15.25	15.00
1911.....	12.75	14.25	14.25	13.75	13.25	13.00	13.00	13.25	12.75	12.00	12.25	12.50
1910.....	17.00	16.50	16.50	15.50	14.50	14.50	14.00	13.75	14.00	13.50	12.75	12.50
1909.....	17.00	15.50	13.75	13.50	14.50	15.50	16.00	17.00	17.50	18.00	18.00	17.25

Cast Borings, Pittsburgh, 1902-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$16.50	$16.60	$15.35	$13.65	$12.00	$13.85	$13.75	$14.20	$14.75	$15.20	$16.25	$17.00
1923.....	18.50	19.75	21.80	21.10	21.60	17.50	15.50	15.00	16.00	13.40	12.40	14.00
1922.....	10.40	11.25	11.85	13.00	14.15	14.80	15.75	15.75	17.30	18.15	17.75	17.50
1921.....	12.50	12.35	11.60	9.70	9.50	9.00	7.60	8.00	9.05	11.60	10.65	9.55
1920.....	19.35	21.70	20.35	19.85	19.25	18.35	18.25	19.55	20.50	19.35	17.00	14.50
1919.....	14.00	11.80	10.95	12.60	11.30	11.65	13.90	16.10	15.75	15.75	17.95	18.35
1918.....	20.00	20.00	20.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	18.00
1917.....	12.35	12.25	13.20	14.70	15.45	21.10	23.90	22.00	23.55	20.70	20.00	20.00
1916.....	11.35	11.40	11.40	11.30	10.30	9.90	8.65	8.00	8.50	9.15	9.85	13.35
1915.....	8.25	8.15	8.40	8.40	8.40	8.65	8.65	9.00	9.25	9.75	10.00	10.20
1914.....	7.90	8.40	9.25	8.40	8.40	7.90	8.15	8.50	8.50	8.25	8.25	8.25
1913.....	10.40	10.40	10.40	10.40	10.40	9.25	8.40	8.15	8.15	8.40	7.75	7.45
1912.....	9.65	9.40	9.15	9.65	10.15	10.15	10.25	10.15	9.90	9.90	10.50	10.40
1911.....	8.65	8.65	9.50	8.75	8.50	8.90	8.90	9.25	9.40	8.50	8.25	8.35
1910.....	11.00	10.75	9.75	9.75	9.25	8.75	8.00	8.25	8.40	8.40	8.50	8.65
1909.....	10.75	9.75	8.25	7.75	7.25	9.65	9.75	9.50	10.65	11.15	11.25	11.00
1908.....	6.50	7.50	8.00	8.00	7.50	7.75	7.75	8.75	8.75	8.75	9.75	11.00
1907.....	12.40	12.65	13.15	13.65	13.50	13.75	13.75	13.25	13.25	13.00	9.95	6.50
1906.....	10.90	10.15	9.65	8.15	8.90	8.75	8.75	9.00	9.75	10.25	10.75	12.25
1905.....	10.75	11.25	11.15	10.90	10.15	10.00	9.15	8.40	8.90	9.75	10.50	10.90
1904.....	6.00	5.75	5.40	6.15	7.15	5.65	5.75	5.25	6.25	6.25	7.40	8.75
1903.....	11.25	11.50	11.65	11.25	11.25	.....	.....	9.00	9.00	7.00	.....	5.25
1902.....	8.55	9.15	9.65	10.75	11.75	12.00	11.65	10.75	14.40	15.85	11.65	11.50

Market History—

Low Phosphorus Scrap, Pittsburgh, 1917-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$23.90	$24.25	$23.75	$20.60	$19.30	$21.40	$21.70	$22.00	$22.25	$22.30	$23.50	$25.00
1923.....	25.15	27.00	31.30	32.10	28.30	25.00	23.15	22.70	23.50	22.50	20.70	22.50
1922.....	17.50	17.10	17.10	18.60	20.00	20.60	21.00	20.60	22.90	24.85	25.00	24.50
1921.....	24.50	22.00	21.20	18.25	18.00	17.00	15.25	15.50	16.30	18.00	17.65	17.25
1920.....	31.50	33.00	32.60	30.60	30.00	30.75	30.00	33.15	34.00	33.75	31.00	25.50
1919.....	29.40	24.25	22.50	22.40	22.00	21.25	23.00	24.00	24.00	24.00	25.75	27.50
1918.....	42.20	40.00	40.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00	38.60	38.50
1917.....	32.00	30.00	33.00	34.25	36.60	43.50	52.75	43.00	47.25	43.50	39.00	39.00

No. 1 Railroad Wrought, Chicago, 1915-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$17.50	$17.50	$16.05	$14.80	$13.60	$13.25	$14.80	$15.75	$16.70	$15.95	$17.10	$18.75
1923.....	19.40	20.50	23.25	22.75	19.95	16.95	16.60	17.05	18.25	15.30	14.10	16.00
1922.....	11.80	11.65	12.25	13.25	14.35	14.20	15.20	16.35	19.95	20.40	18.10	17.00
1921.....	15.65	15.90	13.50	12.05	11.90	10.80	10.25	11.75	13.05	14.65	13.70	12.10
1920.....	29.00	30.75	30.70	30.70	29.50	28.00	28.10	28.50	27.50	22.50	19.55	16.60
1919.....	23.30	16.65	17.65	18.50	17.05	18.70	21.20	23.25	21.25	22.00	26.50	27.00
1918.....	35.00	35.00	35.00*	35.00	35.00	35.00	35.50	33.50	33.50	33.50	33.50	29.00
1917.....	23.75	24.00	25.75	29.80	32.60	41.75	39.15	35.40	36.25	31.90	30.60	31.50
1916.....	15.50	14.95	16.15	16.80	16.35	15.35	13.95	15.40	16.65	17.50	21.25	26.00
1915.....	8.80	8.90	9.00	8.55	8.75	8.75	8.90	10.10	10.75	10.70	12.75	14.90

* Quotations net tons to March 31, 1918, gross tons thereafter.

No. 1 Railroad Wrought, Eastern Pennsylvania, 1904-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$20.10	$21.35	$19.00	$18.40	$17.75	$17.75	$18.05	$18.50	$18.75	$18.75	$18.95	$19.00
1923.....	22.25	24.10	27.60	27.00	24.40	22.75	18.85	17.50	19.00	18.00	17.75	19.00
1922.....	15.00	15.00	15.20	15.63	16.80	17.25	18.00	18.00	20.75	22.00	21.00	18.95
1921.....	20.00	20.00	18.20	15.50	15.00	15.00	14.25	14.00	14.20	15.40	16.00	15.75
1920.....	32.90	36.10	36.50	35.25	34.00	33.50	33.50	33.25	34.40	29.85	25.75	20.10
1919.....	29.80	25.00	24.00	21.50	21.90	22.50	24.70	27.25	27.00	27.00	27.85	30.75
1918.....	35.00	35.00	35.00*	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
1917.....	27.00	26.75	30.00	36.00	40.80	47.85	54.05	46.20	44.50	41.80	35.35	35.00
1916.....	22.25	22.50	23.00	23.00	22.50	20.00	19.75	20.00	21.00	22.00	20.55	26.75
1915.....	11.75	12.00	12.50	12.50	12.50	12.75	13.50	15.00	16.00	16.00	17.00	20.00
1914.....	12.90	14.75	15.25	13.15	13.15	12.65	12.65	12.00	12.50	11.50	11.50	11.50
1913.....	16.25	16.25	15.25	16.25	15.50	14.75	14.70	14.25	14.25	14.25	13.75	13.35
1912.....	15.75	14.75	14.50	14.25	16.25	16.00	15.75	15.25	16.65	16.75	17.75	16.75
1911.....	16.25	16.25	17.75	16.75	15.50	15.25	15.25	15.75	15.75	14.50	14.00	14.45
1910.....	18.75	19.00	18.75	19.25	18.25	16.75	16.25	16.25	16.15	16.75	16.25	16.25
1909.....	20.25	19.25	16.25	15.25	16.25	18.60	17.75	18.75	19.75	20.75	21.25	20.25
1908.....	14.25	14.25	15.25	14.75	15.50	15.75	16.00	16.50	18.25	18.25	18.50	19.75
1907.....	23.25	22.25	21.00	20.50	20.00	20.75	20.25	19.75	18.00	18.00	17.25	14.75
1906.....	22.75	21.00	19.75	20.25	20.75	18.25	17.50	18.25	20.75	22.25	22.25	23.25
1905.....	19.75	21.75	22.00	22.75	21.75	18.75	17.00	17.50	19.50	21.75	19.85	23.25
1904.....	14.65	16.00	16.50	18.25	17.75	14.00	12.75	13.25	14.40	15.25	16.25	19.00

* Quotations net tons to March 31, 1918, gross tons thereafter.

Machine Shop Turnings, Pittsburgh, 1906-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$15.50	$16.10	$15.00	$13.25	$11.10	$13.00	$13.50	$14.00	$14.75	$14.40	$16.00	$17.50
1923.....	16.75	18.25	20.65	20.10	18.91	16.60	13.50	11.40	12.75	11.40	11.00	13.50
1922.....	9.50	9.55	10.65	12.30	13.45	13.65	13.75	13.95	15.45	15.40	16.25	15.90
1921.....	10.50	10.50	9.70	8.55	8.50	7.90	7.25	7.65	8.55	10.25	10.25	9.20
1920.....	16.75	19.25	18.40	16.85	15.15	17.65	13.55	15.75	15.80	16.00	14.75	11.60
1919.....	11.50	9.70	9.75	11.15	10.00	10.65	12.70	14.00	13.25	12.75	14.00	15.50
1918.....	20.00	20.00	20.00	19.00	18.70	18.50	18.50	18.50	18.50	18.50	18.50	17.75
1917.....	12.10	12.00	12.45	13.90	14.55	20.80	23.70	21.20	23.25	19.50	19.65	20.00
1916.....	10.35	9.55	10.75	11.20	10.35	10.05	8.55	7.75	7.25	8.00	9.10	12.75
1915.....	7.75	7.90	7.90	7.90	7.90	8.15	8.00	7.65	8.65	8.65	9.15	8.75
1914.....	6.90	7.65	8.70	8.15	8.00	7.90	7.90	7.90	7.90	8.00	7.95	7.75
1913.....	10.65	10.25	9.50	9.00	8.65	7.25	6.75	6.75	6.75	7.15	7.15	6.40
1912.....	10.25	9.75	9.50	10.00	10.25	10.90	11.00	11.00	10.65	10.90	11.50	11.25
1911.....	9.00	9.40	10.50	9.50	9.15	9.15	9.15	9.75	9.65	9.15	9.90	9.35
1910.....	13.25	13.00	12.00	11.75	11.25	10.25	9.25	9.25	9.00	9.00	9.15	9.25
1909.....	13.00	11.75	10.25	8.75	8.25	11.25	11.75	11.50	12.50	13.25	13.75	13.25
1908.....	7.75	8.75	8.75	8.50	8.25	8.25	8.25	9.00	9.50	9.50	10.50	11.75
1907.....	15.25	15.00	15.75	16.00	15.75	15.50	15.50	15.25	14.50	14.00	11.60	7.75
1906.....	.....	.....	12.50	11.75	11.25	11.25	11.25	11.50	12.40	12.25	12.40	14.75

No. 1 Cast, Pittsburgh, 1917-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$21.30	$20.85	$19.60	$18.35	$17.50	$17.75	$17.70	$18.00	$18.35	$17.70	$18.25	$18.50
1923.....	22.65	24.50	27.70	27.75	25.60	23.75	21.50	21.20	21.50	19.35	18.50	20.00
1922.....	16.00	16.00	16.40	17.25	18.50	18.70	19.15	19.00	21.75	23.35	23.30	22.50
1921.....	24.50	22.00	21.00	18.25	17.50	16.00	15.00	14.85	16.30	17.50	17.10	16.25
1920.....	32.50	41.50	41.00	39.60	39.00	40.00	38.50	41.50	42.20	40.75	38.00	27.50
1919.....	25.60	21.00	21.00	21.75	21.00	21.00	21.00	24.00	24.50	25.00	28.75	30.50
1918.....	28.00	28.00	28.00	34.00	32.50	32.50	32.50	32.50	32.50	32.50	32.40	32.00
1917.....	20.00	19.75	21.50	23.35	24.60	33.25	34.75	35.00	32.50	28.00	28.50	28.50

Market History—

No. 1 Cast, Eastern Pennsylvania, 1915-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$20.75	$20.35	$19.25	$18.35	$17.10	$17.90	$17.80	$18.00	$18.40	$17.95	$18.25	$19.50
1923.....	23.30	24.75	28.00	26.85	24.80	22.75	21.00	20.00	20.35	19.70	19.50	20.50
1922.....	16.75	16.50	17.00	17.40	17.90	18.50	18.00	18.00	20.65	23.00	21.90	20.50
1921.....	24.15	23.35	20.50	18.15	17.90	17.50	17.50	16.50	16.50	17.50	18.00	17.50
1920.....	36.50	38.55	40.00	38.00	38.00	37.00	37.20	38.75	39.80	38.00	34.75	28.90
1919.....	28.15	25.00	22.50	22.50	21.50	22.00	23.50	24.65	25.00	25.15	28.00	31.75
1918.....	33.50	34.50	33.90	32.75	33.00	33.75	34.00	34.00	34.00	34.00	34.00	34.00
1917.....	20.75	20.15	22.50	26.75	30.00	34.75	38.35	34.10	32.90	30.00	30.50	32.00
1916.....	17.50	17.50	17.75	18.00	17.75	16.50	16.00	16.00	16.25	16.50	18.50	22.00
1915.....	12.00	12.00	12.50	12.50	12.00	12.25	12.25	13.50	14.50	14.50	15.00	15.60

No. 1 Cast, Chicago, 1918-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$22.10	$22.25	$20.80	$20.00	$19.00	$17.75	$18.60	$19.00	$20.25	$19.20	$19.25	$20.75
1923.....	24.30	25.75	28.50	27.55	24.20	23.25	23.25	21.20	21.50	20.40	20.55	21.50
1922.....	14.00	14.50	15.10	16.15	17.40	17.30	17.65	19.70	23.80	24.00	22.90	22.00
1921.....	20.35	21.15	18.10	15.25	15.85	14.90	13.75	13.95	14.50	15.25	15.50	14.00
1920.....	42.50	43.25	42.20	44.10	42.50	41.75	41.20	42.00	39.30	32.75	27.65	22.10
1919.....	26.25	22.05	23.10	23.50	22.35	23.40	20.65	27.75	26.75	28.15	31.10	35.35
1918.....	30.00	30.00	33.00	32.45	30.75	31.00	31.80	33.40	34.00	34.00	32.75	29.00

Rerolling Rails, Chicago, 1908-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$18.90	$20.00	$19.30	$17.10	$15.30	$14.55	$15.50	$16.00	$17.40	$17.20	$18.20	$19.50
1923.....	20.55	22.00	24.90	23.65	21.80	19.40	18.40	17.75	18.30	16.25	15.10	17.00
1922.....	12.50	11.50	12.85	14.25	15.50	15.40	16.00	16.75	19.40	20.50	18.90	18.00
1921.....	15.80	15.90	13.30	12.70	13.25	12.80	12.45	12.70	13.05	14.00	13.90	12.50
1920.....	33.60	34.65	32.60	32.50	31.50	32.35	34.90	38.00	38.50	34.00	24.15	17.40
1919.....	22.30	15.55	16.30	17.95	17.45	19.25	24.70	29.00	25.38	26.80	31.15	31.50
1918.....	35.30	35.00	35.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
1917.....	27.25	25.65	27.25	31.90	36.80	46.00	46.25	41.90	41.25	36.00	35.70	35.65
1916.....	17.70	17.10	17.20	17.90	17.25	16.25	15.70	15.70	16.90	18.75	24.90	29.50
1915.....	9.50	9.60	10.00	9.85	10.00	10.00	10.10	11.75	13.15	13.25	14.30	16.70
1914.....	11.00	11.20	11.25	11.25	11.25	11.25	11.25	11.25	10.85	10.00	9.50	9.50
1913.....	16.25	15.50	15.00	14.50	14.00	14.00	12.00	12.50	12.00	12.00	12.00	11.50
1912.....	13.00	13.00	12.75	12.75	13.25	13.50	13.25	13.50	14.75	16.00	16.50	16.50
1911.....	13.50	13.50	13.50	13.00	12.75	12.25	12.25	12.50	12.25	12.25	12.00	12.25
1910.....	17.75	17.75	17.50	17.50	17.25	16.50	16.50	15.50	15.75	15.75	15.00	14.00
1909.....	15.80	15.05	12.80	13.20	14.65	15.50	15.55	16.00	17.20	18.00	20.25	17.70
1908.....	12.30	13.00	12.20	12.75	13.20	14.00	14.45	15.60	16.00	15.70	16.95	17.25

Iron Car Wheels, Chicago, 1915-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$20.60	$21.25	$19.90	$17.50	$16.60	$15.65	$16.40	$16.90	$18.40	$17.90	$18.60	$19.50
1923.....	25.35	26.50	28.50	27.65	24.30	21.50	20.90	19.60	19.60	18.60	17.85	19.00
1922.....	15.25	14.65	15.90	18.15	18.80	18.25	18.90	20.40	23.50	24.75	24.60	23.75
1921.....	21.50	21.40	16.60	14.45	14.50	13.70	12.75	13.70	14.90	16.15	16.25	15.90
1920.....	36.25	38.75	36.15	38.50	38.25	36.00	35.70	38.40	38.80	37.25	33.25	25.80
1919.....	23.20	21.15	20.00	20.40	20.20	22.00	24.40	25.15	23.50	23.60	28.50	29.75
1918.....	30.40	30.00	30.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	29.00	27.50
1917.....	19.75	18.30	20.30	23.25	27.20	37.00	36.75	30.70	31.00	25.90	27.50	29.50
1916.....	14.75	14.05	14.05	14.00	13.15	12.50	11.90	12.00	12.25	12.25	15.95	21.00
1915.....	10.00	10.00	10.00	10.00	9.75	9.85	10.30	11.40	11.75	11.75	12.75	14.75

Finished Rolled Material

Per Pound

Steel Bars, Pittsburgh, 1901-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.40c	2.40c	2.40c	2.30c	2.25c	2.20c	2.15c	2.10c	2.05c	2.00c	2.05c	2.10c
1923.....	2.00	2.15	2.30	2.35	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
1922.....	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	2.00
1921.....	2.35	2.15	2.00	2.05	2.10	2.05	1.85	1.75	1.65	1.60	1.55	1.50
1920.....	3.10	3.85	3.85	3.65	3.25	3.25	3.25	3.25	3.25	3.25	3.00	2.35
1919.....	2.70	2.70	2.60	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.45	2.90
1918.....	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
1917.....	3.20	3.20	3.45	3.65	3.65	4.00	4.70	4.75	4.25	2.90	2.90	2.90
1916.....	2.40	2.40	2.65	3.00	3.00	2.85	2.75	2.55	2.60	2.70	2.95	3.15
1915.....	1.10	1.10	1.15	1.20	1.20	1.20	1.30	1.35	1.30	1.45	1.70	1.90
1914.....	1.20	1.20	1.20	1.15	1.15	1.15	1.15	1.15	1.20	1.15	1.10	1.10
1913.....	1.45	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.35	1.25
1912.....	1.15	1.15	1.10	1.15	1.20	1.20	1.25	1.30	1.35	1.40	1.40	1.40
1911.....	1.40	1.40	1.40	1.40	1.40	1.25	1.25	1.20	1.15	1.10	1.10	1.10
1910.....	1.50	1.45	1.45	1.45	1.45	1.45	1.45	1.40	1.40	1.40	1.40	1.40
1909.....	1.40	1.30	1.20	1.15	1.20	1.20	1.25	1.35	1.40	1.40	1.45	1.50
1908.....	1.60	1.60	1.60	1.60	1.60	1.50	1.40	1.40	1.40	1.40	1.40	1.40
1907.....	1.60	1.60	1.60	1.60	1.60	1 60	1.60	1.60	1.60	1.60	1.60	1.60
1906.....	2.00	1.75	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.55	1.60
1905.....	1.45	1.45	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.70	1.80	1.95
1904.....	1.30	1.30	1.35	1.35	1.30	1.30	1.30	1.30	1.35	1.30	1.30	1.40
1903.....	1.65	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.35	1.30
1902.....	1.60	1.50	1.50	1.65	1.80	1.80	1.70	1.75	1.75	1.70	1.60	1.70
1901.....	1.20	1.25	1.45	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.60

Market History—

Tank Plates, Pittsburgh, 1895-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.50c	2.45c	2.40c	2.35c	2.25c	2.15c	2.10c	2.00c	1.95c	1.80c	1.85c	1.90c
1923.....	2.05	2.15	2.35	2.45	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1922.....	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	2.00
1921.....	2.65	2.35	2.05	2.15	2.20	2.00	1.85	1.75	1.70	1.60	1.60	1.50
1920.....	3.10	3.70	3.75	3.65	3.50	3.50	3.50	3.50	3.50	3.20	3.00	2.65
1919.....	3.00	3.00	2.90	2.65	2.65	2.65	2.65	2.65	2.55	2.65	2.65	2.70
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917.....	4.25	4.30	5.00	5.45	6.40	7.75	9.45	9.20	7.50	3.25	3.25	3.25
1916.....	2.50	2.55	3.15	3.50	3.50	3.50	3.50	3.75	3.70	3.70	3.90	4.25
1915.....	1.10	1.10	1.15	1.15	1.15	1.20	1.25	1.30	1.35	1.45	1.70	1.95
1914.....	1.20	1.20	1.20	1.15	1.15	1.15	1.15	1.15	1.20	1.20	1.10	1.10
1913.....	1.50	1.50	1.50	1.50	1.50	1.45	1.45	1.45	1.40	1.35	1.30	1.20
1912.....	1.15	1.10	1.10	1.20	1.25	1.25	1.30	1.35	1.40	1.45	1.50	1.55
1911.....	1.40	1.40	1.40	1.40	1.40	1.35	1.35	1.30	1.25	1.20	1.10	1.15
1910.....	1.55	1.55	1.50	1.50	1.50	1.45	1.40	1.40	1.40	1.40	1.40	1.40
1909.....	1.60	1.45	1.30	1.20	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908.....	1.70	1.70	1.70	1.70	1.70	1.65	1.60	1.60	1.60	1.60	1.60	1.60
1907.....	1.70	1.70	1.70	1.70	1.80	1.80	1.80	1.70	1.70	1.70	1.70	1.70
1906.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.70
1905.....	1.45	1.50	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.60	1.60	1.60
1904.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.40	1.40	1.40	1.50
1903.....	1.60	1.60	1.75	1.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1902.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1901.....	1.40	1.40	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1900.....	2.40	2.20	2.00	1.80	1.60	1.35	1.05	1.10	1.05	1.05	1.35	1.40
1899.....	1.30	1.45	1.75	2.05	2.10	2.30	2.45	2.55	2.85	2.80	2.50	2.30
1898.....	1.00	1.00	0.95	1.00	1.10	1.10	1.10	1.10	1.15	1.10	1.10	1.15
1897.....	1.10	1.10	1.10	1.05	1.05	1.00	1.00	1.00	1.00	1.05	1.00	1.00
1896.....	1.40	1.35	1.30	1.35	1.30	1.25	1.25	1.20	1.15	1.15	1.10	1.10
1895.....	1.15	1.10	1.10	1.15	1.20	1.25	1.60	1.70	1.80	1.70	1.60	1.50

Structural Shapes, Pittsburgh, 1895-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.50c	2.50c	2.50c	2.35c	2.25c	2.20c	2.15c	2.05c	2.00c	2.00c	2.00c	2.00c
1923.....	2.05	2.15	2.35	2.45	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1922.....	1.50	1.40	1.45	1.50	1.60	1.65	1.70	1.80	2.00	2.00	2.00	1.95
1921.....	2.45	2.25	2.10	2.15	2.20	2.05	1.90	1.75	1.70	1.60	1.60	1.50
1920.....	2.65	3.15	3.25	3.25	3.25	3.25	3.25	3.15	3.10	3.10	3.00	2.45
1919.....	2.80	2.80	2.70	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.50
1918.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1917.....	3.10	3.25	3.45	3.70	4.00	4.00	4.50	4.50	3.75	3.00	3.00	3.00
1916.....	1.85	2.05	2.40	2.50	2.50	2.50	2.50	2.50	2.60	2.70	2.90	3.00
1915.....	1.10	1.10	1.15	1.15	1.20	1.20	1.25	1.30	1.35	1.40	1.65	1.75
1914.....	1.20	1.20	1.20	1.20	1.15	1.10	1.10	1.15	1.20	1.15	1.10	1.05
1913.....	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.40	1.35	1.30	1.25
1912.....	1.15	1.15	1.15	1.20	1.25	1.25	1.30	1.35	1.40	1.45	1.50	1.55
1911.....	1.40	1.40	1.40	1.40	1.40	1.35	1.35	1.35	1.35	1.30	1.20	1.15
1910.....	1.55	1.55	1.50	1.50	1.50	1.45	1.40	1.40	1.40	1.40	1.40	1.40
1909.....	1.60	1.45	1.30	1.20	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908.....	1.70	1.70	1.70	1.70	1.70	1.65	1.65	1.60	1.60	1.60	1.60	1.60
1907.....	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
1906.....	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
1905.....	1.50	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.70	1.70	1.70	1.70
1904.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.40	1.40	1.40	1.40
1903.....	1.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1902.....	1.60	1.60	1.70	1.85	2.00	2.25	2.25	2.35	2.25	2.15	2.10	2.00
1901.....	1.50	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1900.....	2.25	2.25	2.25	2.25	2.25	2.05	1.90	1.75	1.70	1.70	1.70	1.70
1899.....	1.30	1.30	1.40	1.50	1.50	1.75	1.95	2.05	2.25	2.25	2.25	2.25
1898.....	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.20	1.20	1.20	1.20	1.20
1897.....	1.55	1.55	1.55	1.55	1.30	1.05	1.00	1.00	1.00	1.10	1.10	1.10
1896.....	1.45	1.50	1.45	1.45	1.50	1.55	1.55	1.55	1.55	1.55	1.50	1.45
1895.....	1.25	1.20	1.20	1.20	1.20	1.35	1.50	1.60	1.65	1.60	1.60	1.55

Bar Iron, Chicago, 1907-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.40c	2.40c	2.40c	2.35c	2.30c	2.25c	2.20c	2.15c	2.15c	2.10c	2.10c	2.00c
1923.....	2.35	2.45	2.55	2.60	2.60	2.60	2.55	2.50	2.40	2.40	2.40	2.40
1922.....	1.60	1.60	1.60	1.65	1.65	1.75	1.80	2.00	2.25	2.50	2.50	2.35
1921.....	2.75	2.65	2.65	2.50	2.45	2.25	1.95	1.75	1.75	1.75	1.70	1.65
1920.....	3.15	3.45	3.50	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.50
1919.....	3.15	2.95	2.85	2.55	2.50	2.55	2.65	2.65	2.65	2.70	2.75	2.75
1918.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.00	3.00	3.00	3.20	3.40	4.00	4.50	4.50	4.50	4.50	4.00	4.00
1916.....	1.85	1.90	2.20	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.50	2.60
1915.....	0.95	1.05	1.10	1.15	1.15	1.15	1.20	1.25	1.30	1.35	1.50	1.70
1914.....	1.15	1.20	1.15	1.15	1.10	1.10	1.05	1.05	1.05	1.05	0.95	0.95
1913.....	1.60	1.60	1.60	1.55	1.55	1.55	1.50	1.45	1.35	1.25	1.15	1.15
1912.....	1.15	1.15	1.15	1.15	1.25	1.25	1.35	1.40	1.45	1.50	1.55	1.55
1911.....	1.30	1.30	1.25	1.20	1.20	1.20	1.20	1.20	1.20	1.15	1.15	1.15
1910.....	1.60	1.60	1.55	1.55	1.50	1.45	1.40	1.40	1.40	1.35	1.35	1.30
1909.....	1.50	1.50	1.40	1.30	1.25	1.30	1.35	1.40	1.50	1.50	1.55	1.60
1908.....	1.60	1.55	1.55	1.55	1.55	1.55	1.50	1.50	1.50	1.50	1.50	1.50
1907.....	1.80	1.80	1.80	1.80	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

Rail Steel Bars, Chicago, 1918-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.30c	2.30c	2.30c	2.30c	2.20c	2.15c	2.10c	2.05c	2.05c	2.00c	2.00c	2.00c
1923.....	2.00	2.00	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
1922.....	1.60	1.50	1.50	1.55	1.65	1.65	1.70	1.80	1.95	2.00	2.00	2.00
1921.....	2.50	2.50	2.50	2.15	2.00	2.00	1.95	1.85	1.85	1.75	1.70	1.65
1920.....	2.90	3.20	3.35	3.70	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
1919.....	2.80	2.80	2.80	2.55	2.45	2.45	2.45	2.55	2.55	2.55	2.75	2.85
1918.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Market History—

No. 28 Black Sheets, Pittsburgh, 1907-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.75c	3.75c	3.75c	3.70c	3.65c	3.65c	3.60c	3.50c	3.45c	3.40c	3.45c	3.50c
1923.....	3.35	3.35	3.55	3.85	3.85	3.85	3.85	3.85	3.75	3.75	3.75	3.75
1922.....	3.00	3.00	3.00	3.10	3.15	3.15	3.15	3.25	3.40	3.50	3.35	3.30
1921.....	4.35	4.20	3.90	3.90	4.00	3.90	3.35	3.05	2.80	3.00	2.95	3.00
1920.....	5.00	6.00	6.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00	6.05	4.45
1919.....	4.70	4.70	4.60	4.35	4.35	4.30	4.30	4.35	4.35	4.35	4.35	4.35
1918.....	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1917.....	4.55	4.55	5.05	5.75	7.00	8.15	9.00	9.00	8.75	7.75	5.30	5.00
1916.....	2.55	2.60	2.75	2.90	2.95	2.90	2.90	2.75	2.85	3.20	3.65	4.45
1915.....	1.80	1.80	1.80	1.80	1.80	1.80	1.75	1.85	1.90	2.05	2.20	2.50
1914.....	1.85	1.95	1.95	1.90	1.85	1.80	1.80	1.90	1.95	1.95	1.90	1.80
1913.....	2.30	2.35	2.35	2.35	2.35	2.30	2.25	2.20	2.10	2.00	1.95	1.90
1912.....	1.90	1.85	1.80	1.85	1.95	1.95	2.00	2.05	2.10	2.20	2.25	2.25
1911.....	2.20	2.20	2.20	2.15	2.15	2.00	2.00	1.95	1.90	1.85	1.85	1.90
1910.....	2.40	2.40	2.40	2.35	2.30	2.25	2.20	2.20	2.15	2.15	2.15	2.15
1909.....	2.40	2.40	2.30	2.20	2.20	2.20	2.20	2.20	2.20	2.30	2.40	2.40
1908.....	2.55	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
1907.....	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

No. 10 Blue Annealed Sheets, Pittsburgh, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.95c	2.90c	2.95c	2.80c	2.80c	2.80c	2.75c	2.70c	2.70c	2.60c	2.60c	2.70c
1923.....	2.50	2.50	2.70	2.80	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.90
1922.....	2.25	2.25	2.25	2.35	2.40	2.40	2.40	2.45	2.50	2.60	2.60	2.50
1921.....	3.55	3.55	3.05	2.95	3.10	3.00	2.55	2.40	2.30	2.50	2.40	2.25
1920.....	4.05	5.50	5.50	4.85	5.00	5.00	5.00	5.00	5.00	5.00	4.95	3.65
1919.....	3.90	3.90	3.80	3.55	3.55	3.50	3.50	3.55	3.55	3.55	3.55	3.55
1918.....	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
1917.....	4.10	4.35	4.70	5.35	6.65	8.00	8.50	8.50	8.50	7.85	4.75	4.25
1916.....	2.45	2.60	2.85	3.00	3.05	3.10	3.00	3.00	2.95	3.15	3.30	3.90
1915.....	1.30	1.30	1.30	1.30	1.35	1.35	1.35	1.35	1.50	1.60	1.85	2.25
1914.....	1.35	1.40	1.40	1.40	1.35	1.35	1.35	1.35	1.40	1.40	1.40	1.35
1913.....	1.70	1.75	1.75	1.75	1.75	1.75	1.70	1.65	1.60	1.55	1.45	1.40

No. 28 Galvanized Sheets, Pittsburgh, 1903-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	4.95c	4.90c	4.90c	4.85c	4.80c	4.80c	4.70c	4.60c	4.60c	4.60c	4.60c	4.60c
1923.....	4.35	4.35	4.65	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.85	4.90
1922.....	4.00	4.00	4.00	4.10	4.15	4.15	4.15	4.25	4.40	4.50	4.35	4.35
1921.....	5.70	5.50	5.05	4.90	5.00	4.90	4.35	4.05	3.80	4.00	3.95	4.00
1920.....	6.35	7.00	7.25	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.35	5.85
1919.....	6.05	6.05	5.95	5.70	5.70	5.65	5.65	5.70	5.70	5.70	5.70	5.70
1918.....	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
1917.....	6.55	6.80	6.80	7.55	8.80	9.95	10.25	10.25	9.70	8.80	6.50	6.25
1916.....	4.75	4.75	4.80	4.85	4.85	4.80	4.35	4.25	4.20	4.45	5.05	6.25
1915.....	2.75	3.00	3.40	3.30	3.40	4.45	4.55	3.95	3.65	3.50	3.90	4.75
1914.....	2.85	2.95	2.95	2.90	2.80	2.75	2.75	2.85	2.95	2.95	2.85	2.80
1913.....	3.45	3.50	3.50	3.50	3.40	3.40	3.30	3.25	3.15	3.05	2.95	2.85
1912.....	3.20	3.20	3.00	3.00	3.10	3.10	3.10	3.30	3.50	3.50	3.50	3.50
1911.....	3.20	3.20	3.20	3.20	3.20	3.00	3.00	3.00	2.80	3.00	3.00	3.20
1910.....	3.70	3.70	3.70	3.70	3.50	3.20	3.20	3.20	3.20	3.20	3.20	3.20
1909.....	3.40	3.30	3 40	3.40	3.40	3.50	3.50	3.50	3.60	3.60	3.70	3.70
1908.....	3.70	3.70	3.70	3.60	3.50	3.50	3.50	3.50	3.30	3.30	3.20	3.20
1907.....	4.00	4.00	4.00	3.80	3.80	3.80	3.70	3.70	3.60	3.60	3.50	3.50
1906.....	3.60	3.60	3.70	3.80	3.80	3.80	3.80	3.90	3.80	4.00	4.00	4.00
1905.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1904.....	3.50	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.50
1903.....	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.50	3.50	3.50

Tin Plate, Pittsburgh, 1903-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50	$5.50
1923.....	4.75	4.75	4.95	4.95	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
1922.....	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
1921.....	7.00	7.00	7.00	6.65	6.25	6.25	5.65	5.25	5.15	5.00	4.80	4.75
1920.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1919.....	7.35	7.35	7.25	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1918.....	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75
1917.....	6.90	7.00	7.50	7.50	7.90	9.25	10.00	10.00	10.00	10.00	8.20	7.75
1916.....	3.75	3.75	4.15	4.70	5.15	5.55	5.80	6.00	5.60	5.75	6.05	6.50
1915.....	3.10	3.10	3.10	3.20	3.20	3.10	3.10	3.10	3.10	3.10	3.35	3.60
1914.....	3.40	3.40	3.40	3.40	3.40	3.30	3.25	3.45	3.55	3.35	3.15	3.20
1913.....	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.55	3.50	3.40
1912.....	3.40	3.40	3.50	3.50	3.50	3.50	3.50	3.70	3.70	3.70	3.70	3.60
1911.....	3.70	3.70	3.70	3.60	3.60	3.60	3.60	3.50	3.50	3.40	3.40	3.40
1910.....	3.50	3.50	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
1909.....	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.50	3.50	3.50
1908.....	3.60	3.60	3.60	3.60	3.60	3.50	3.50	3.50	3.50	3.50	3.50	3.40
1907.....	3.90	3.90	3.90	3.90	3.80	3.80	3.70	3.70	3.70	3.60	3.60	3.60
1906.....	3.50	3.50	3.50	3.60	3.70	3.70	3.80	3.90	3.90	3.90	4.00	4.00
1905.....	3.50	3.50	3.50	3.50	3.50	3.40	3.40	3.40	3.30	3.30	3.40	3.50
1904.....	3.40	3.40	3.30	3.30	3.20	3.20	3.20	3.10	3.30	3.40	3.50	3.50
1903.....	3.80	3.80	3.90	3.90	3.80	3.80	3.70	3.70	3.60	3.60	3.60	3.50

Cold Finished Steel Bars, Pittsburgh, 1920-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.00c	3.00c	3.00c	3.00c	3.00c	2.90c	2.85c	2.80c	2.75c	2.70c	2.70c	2.80c
1923.....	2.50	2.65	2.85	3.00	3.25	3.25	3.25	3.25	3.25	3.25	3.00	2.90
1922.....	2.00	1.90	1.85	1.85	2.00	2.00	2.05	2.15	2.50	2.50	2.50	2.50
1921.....	3.60	3.60	3.10	3.05	3.10	3.00	2.75	2.50	2.40	2.25	2.15	2.00
1920.....	3.65	3.85	4.50	5.25	4.40	4.50	4.10	4.55	4.25	4.10	4.00	3.60

Market History—

Plain Wire, Pittsburgh, 1915-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.75c	2.75c	2.75c	2.75c	2.70c	2.65c	2.60c	2.60c	2.55c	2.50c	2.50c	2.60c
1923.....	2.45	2.60	2.65	2.70	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1922.....	2.25	2.20	2.25	2.25	2.25	2.25	2.25	2.25	2.40	2.45	2.45	2.45
1921.....	3.25	3.20	3.00	3.00	3.00	2.75	2.50	2.50	2.60	2.60	2.60	2.25
1920.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.20	3.25	3.25	3.25
1919.....	3.25	3.25	3.20	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.15	3.25
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917.....	2.95	2.95	3.10	3.20	3.45	3.60	3.95	3.95	3.95	3.85	3.25	3.25
1916.....	1.95	2.10	2.25	2.25	2.45	2.45	2.45	2.55	2.55	2.60	2.80	2.95
1915.....	1.30	1.35	1.40	1.40	1.35	1.35	1.40	1.40	1.55	1.60	1.70	1.90

Wire Nails, Pittsburgh, 1907-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.00c	3.00c	3.00c	3.00c	2.95c	2.90c	2.85c	2.85c	2.80c	2.75c	2.75c	2.85c
1923.....	2.70	2.75	2.90	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
1922.....	2.50	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.65	2.70	2.70	2.70
1921.....	3.25	3.00	3.00	3.25	3.25	3.00	2.75	2.75	2.90	2.90	2.90	2.50
1920.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1919.....	3.50	3.50	3.45	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.45	3.50
1918.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.00	3.00	3.15	3.20	3.50	3.65	4.00	4.00	4.00	3.90	3.50	3.50
1916.....	2.15	2.20	2.40	2.40	2.50	2.50	2.50	2.60	2.60	2.65	2.85	3.00
1915.....	1.50	1.55	1.60	1.60	1.55	1.55	1.60	1.60	1.70	1.75	1.85	2.00
1914.....	1.55	1.60	1.60	1.60	1.60	1.55	1.55	1.55	1.60	1.60	1.60	1.50
1913.....	1.75	1.75	1.75	1.80	1.80	1.80	1.75	1.70	1.65	1.60	1.60	1.60
1912.....	1.55	1.60	1.60	1.60	1.60	1.60	1.60	1.65	1.70	1.70	1.75	1.75
1911.....	1.70	1.75	1.80	1.80	1.75	1.80	1.70	1.70	1.65	1.65	1.55	1.55
1910.....	1.85	1.85	1.85	1.85	1.80	1.80	1.70	1.70	1.70	1.70	1.65	1.70
1909.....	1.95	1.95	1.95	1.95	1.60	1.70	1.70	1.80	1.80	1.80	1.80	1.85
1908.....	2.05	2.05	2.05	2.05	2.05	2.00	1.95	1.95	1.95	1.95	1.95	1.95
1907.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.05	2.05	2.05	2.05

Cold Rolled Strip, Pittsburgh, 1910-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	5.00c	4.80c	4.80c	4.75c	4.50c	4.50c	4.35c	4.20c	4.00c	4.00c	4.00c	4.15c
1923.....	4.50	4.65	4.80	5.15	5.25	5.25	5.00	5.00	5.00	5.00	5.00	4.75
1922.....	3.50	3.50	3.50	3.60	3.70	3.95	4.00	4.00	4.25	4.50	4.50	4.50
1921.....	6.25	6.25	5.65	5.50	5.50	5.00	4.40	3.90	3.75	3.75	3.80	3.75
1920.....	5.65	7.00	8.80	8.50	8.50	8.50	8.50	8.50	7.35	8.50	8.00	6.85
1919.....	6.25	6.25	6.10	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65	5.65
1918.....	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1917.....	6.50	6.50	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.50	6.50
1916.....	4.25	4.65	5.50	6.00	6.00	6.00	6.00	6.00	6.00	6.50	6.50	6.50
1915.....	2.75	2.75	2.75	2.75	2.75	2.85	2.85	3.00	3.10	3.25	3.50	3.75
1914.....	3.05	3.05	3.05	3.05	3.05	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1913.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.05
1912.....	2.95	2.95	2.95	2.95	3.00	3.05	3.05	3.05	3.05	3.15	3.20	3.25
1911.....	2.95	2.95	3.25	3.25	3.25	2.95	2.95	2.95	2.95	2.95	2.95	2.95
1910.....	....	....	....	....	....	....	2.95	2.95	2.95	2.95	2.95	2.95

Hot Rolled Strip, Pittsburgh, 1917-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.00c	2.95c	2.85c	2.75c	2.60c	2.55c	2.50c	2.50c	2.45c	2.35c	2.25c	2.35c
1923.....	2.75	2.85	3.10	3.30	3.30	3.30	3.20	3.15	3.10	3.00	3.00	2.75
1922.....	2.00	1.80	1.80	1.95	2.05	2.35	2.50	2.50	2.75	2.90	2.90	2.80
1921.....	3.30	3.30	2.85	2.75	2.75	2.70	2.50	2.30	2.15	2.15	2.25	2.00
1920.....	3.70	4.80	5.25	5.45	5.50	5.50	5.50	5.50	5.50	5.50	5.00	3.90
1919.....	3.80	3.55	3.30	3.25	3.05	3.05	3.10	3.30	3.30	3.30	*3.30	*3.30
1918.....	4.50	4.50	4.50	4.50	4.25	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	....	....	....	....	....	7.25	7.25	7.25	7.00	7.00	5.25	4.50

* First quarter 1920 delivery.

Hoops, Pittsburgh, 1908-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.00c	3.00c	2.85c	2.75c	2.75c	2.70c	2.60c	2.60c	2.55c	2.50c	2.50c	2.50c
1923.....	2.75	2.85	3.10	3.30	3.30	3.30	3.15	3.15	3.15	3.15	3.00	2.90
1922.....	1.95	1.85	1.80	1.95	2.05	2.35	2.45	2.55	2.75	2.90	2.90	2.80
1921.....	3.05	3.05	2.70	2.75	2.75	2.70	2.45	2.40	2.30	2.25	2.20	2.15
1920.....	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1919.....	3.30	3.30	3.25	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1918.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.50	3.50	3.90	4.10	4.70	5.75	6.00	6.00	6.00	6.00	4.60	3.50
1916.....	2.00	2.25	2.55	2.75	2.75	2.75	2.75	2.80	3.00	3.00	3.25	3.25
1915.....	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.30	1.40	1.50	1.75	1.95
1914.....	1.40	1.30	1.30	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
1913.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.50	1.40
1912.....	1.30	1.25	1.25	1.25	1.25	1.25	1.35	1.40	1.40	1.45	1.50	1.50
1911.....	1.50	1.50	1.45	1.45	1.45	1.45	1.40	1.40	1.35	1.35	1.30	1.30
1910.....	1.60	1.60	1.60	1.60	1.50	1.55	1.55	1.55	1.50	1.50	1.50	1.50
1909.....	1.80	1.75	1.60	1.60	1.50	1.40	1.40	1.40	1.50	1.50	1.50	1.55
1908.....	2.00	2.00	2.00	2.00	2.00	1.90	1.80	1.80	1.80	1.80	1.80	1.80

Bands, Pittsburgh, 1916-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.00c	3.00c	2.85c	2.75c	2.75c	2.70c	2.60c	2.60c	2.40c	2.40c	2.40c	2.40c
1923.....	2.75	2.85	3.10	3.30	3.30	3.30	3.15	3.15	3.15	3.15	3.00	2.90
1922.....	1.75	1.75	1.70	1.85	2.05	2.35	2.45	2.55	2.75	2.90	2.90	2.80
1921.....	3.05	3.05	2.70	2.75	2.75	2.70	2.35	2.20	2.20	2.25	2.15	2.00
1920.....	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1919.....	3.30	3.30	3.25	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05
1918.....	2.90	2.90	2.90	2.90	3.00	3.50	3.50	3.50	3.50	3.50	3.50	3.50
1917.....	3.00	3.00	3.35	3.35	3.60	5.50	6.00	6.00	6.00	6.00	4.30	2.90
1916.....	1.85	2.05	2.35	2.50	2.50	2.50	2.50	2.60	2.60	2.60	2.75	2.90

Market History—

Angle Bars, Chicago, 1914-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c	2.75c
1923.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1922.....	2.45	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.50	2.75	2.75	2.75
1921.....	2.75	2.75	2.75	2.70	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.55
1920.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1919.....	3.00	3.00	3.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.15
1917.....	2.25	2.25	2.35	2.75	2.95	3.25	3.45	3.25	3.25	3.25	3.25	3.25
1916.....	1.50	1.50	1.50	1.50	1.90	2.00	2.00	2.00	2.00	2.15	2.25	2.25
1915.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
1914.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

Tie Plates, Chicago, 1915-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.60c	2.60c	2.60c	2.60c	2.60c	2.60c	2.55c	2.45c	2.45c	2.35c	2.35c	2.35c
1923.....	2.40	2.45	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
1922.....	1.90	1.85	1.75	1.80	1.85	1.85	1.85	2.00	2.20	2.35	2.35	2.35
1921.....	3.00	3.00	3.00	2.75	2.50	2.50	2.40	2.15	2.00	2.00	2.00	1.90
1920.....	2.75	2.75	2.75	2.75	2.75	2.75	2.80	3.00	3.00	3.00	3.00	3.00
1919.....	3.00	3.00	3.00	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
1918.....	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
1917.....	2.75	2.75	2.90	3.00	3.00	3.00	3.40	3.50	3.50	3.50	3.50	3.45
1916.....	1.80	2.05	2.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.75
1915.....	....	....	....	....	....	....	....	....	1.50	1.50	1.70	1.80

Track Bolts, Chicago, 1914-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	4.10c	4.10c	4.10c	4.10c	4.10c	4.10c	3.90c	3.80c	3.80c	3.80c	3.80c	3.80c
1923.....	3.90	4.05	4.15	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
1922.....	3.60	3.50	3.50	3.60	3.90	3.90	3.60	3.60	3.80	3.85	3.85	3.85
1921.....	5.00	5.00	5.00	4.85	4.75	4.45	4.40	4.15	3.65	3.65	3.65	3.60
1920.....	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.75	4.95	5.00	5.00	5.00
1919.....	4.90	4.90	4.90	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
1918.....	4.90	4.85	5.05	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
1917.....	4.25	4.50	4.50	4.55	5.00	5.05	5.55	5.25	5.25	5.25	5.25	5.15
1916.....	2.60	2.65	3.20	3.25	3.25	3.25	3.25	3.25	3.25	3.60	4.20	4.25
1915.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.10	2.35	2.50
1914.....	2.05	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Railroad Spikes, Pittsburgh, 1916-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	3.05c	3.05c	3.05c	3.00c	2.95c	2.90c	2.80c	2.80c	2.75c	2.70c	2.75c	2.80c
1923.....	2.85	2.90	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.05
1922.....	2.25	2.15	2.05	2.20	2.25	2.30	2.25	2.30	2.80	2.80	2.75	2.75
1921.....	3.65	3.65	3.30	3.30	3.25	3.25	3.00	2.75	2.45	2.35	2.30	2.25
1920.....	3.45	3.70	3.95	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.75
1919.....	3.65	3.65	3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35
1918.....	4.00	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
1917.....	3.40	3.40	3.50	3.65	3.90	4.20	4.70	6.20	6.50	6.15	5.00	4.75
1916.....	2.15	2.25	2.50	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	3.25

Structural Rivets, Pittsburgh, 1913-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	2.85c	2.75c	2.75c	2.65c	2.60c	2.55c	2.50c	2.50c	2.55c	2.60c	2.60c	2.60c
1923.....	3.00	3.00	3.25	3.25	3.25	3.25	3.15	3.00	3.00	3.00	2.75	2.90
1922.....	2.25	2.00	2.00	2.05	2.20	2.35	2.40	2.45	3.00	3.00	3.00	3.00
1921.....	4.15	3.90	3.70	3.60	3.30	3.00	2.70	2.35	2.30	2.40	2.30	2.30
1920.....	4.15	4.40	4.50	4.50	4.50	4.50	4.50	4.50	4.60	4.75	4.75	4.50
1919.....	4.40	4.20	4.20	3.70	3.70	3.70	3.70	3.90	3.90	3.90	4.00	4.05
1918.....	4.65	4.65	4.65	4.65	4.60	4.40	4.40	4.40	4.40	4.40	4.40	4.40
1917.....	4.25	4.25	4.50	4.75	5.05	5.25	5.25	5.25	5.25	5.25	5.00	4.65
1916.....	2.60	2.75	3.10	3.35	3.90	4.25	4.05	4.00	4.00	4.00	4.10	4.25
1915.....	1.45	1.45	1.45	1.45	1.45	1.50	1.50	1.50	1.60	1.75	2.30	2.45
1914.....	1.60	1.60	1.60	1.60	1.60	1.55	1.50	1.50	1.55	1.50	1.45	1.45
1913.....	2.20	2.20	2.20	2.20	2.15	2.15	2.10	2.00	2.00	1.90	1.80	1.75

Cast Iron Pipe, New York, 1918-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$66.10	$66.10	$66.10	$66.10	$66.10	$65.10	$65.10	$64.10	$64.10	$64.10	$62.10	$60.60
1923.....	56.50	57.30	58.40	58.70	59.00	59.00	59.00	59.20	63.60	63.60	62.80	66.60
1922.....	47.30	47.30	47.60	48.80	48.80	49.80	53.30	54.50	55.30	55.30	55.30	55.30
1921.....	63.30	63.30	63.30	63.30	61.30	52.70	48.55	47.05	45.30	47.55	47.30	47.30
1920.....	67.30	70.30	71.30	73.30	76.30	76.30	76.30	76.30	77.20	77.20	77.20	77.20
1919.....	66.20	62.70	61.65	57.70	56.70	52.70	52.70	53.10	54.30	56.70	58.30	61.30
1918.....	55.35	55.35	55.35	55.35	56.55	61.35	62.30	62.50	62.70	67.50	67.70	67.70

Cast Iron Pipe, Chicago, 1918-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$56.00	$57.20	$57.20	$56.95	$55.40	$55.20	$52.20	$52.70	$52.20	$50.00	$48.00	$47.00
1923.....	51.20	53.20	53.70	55.20	57.20	57.20	59.20	60.45	59.20	57.95	56.85	59.20
1922.....	41.60	42.10	43.00	43.85	44.70	46.60	45.55	45.20	47.85	52.20	51.20	51.20
1921.....	64.10	64.10	64.10	64.10	64.10	51.50	47.60	44.35	42.90	42.60	42.60	42.60
1920.....	67.55	71.30	72.80	74.40	76.80	76.80	76.80	76.80	81.50	83.10	83.10	83.10
1919.....	64.30	61.80	60.55	56.80	54.80	51.80	52.60	54.80	55.80	59.80	59.80	63.80
1918.....	54.30	54.30	54.30	54.30	55.50	60.80	62.05	61.85	61.80	66.80	66.80	66.80

Cast Iron Pipe, Birmingham, 1918-1924

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1924.....	$46.80	$47.50	$48.00	$48.00	$48.00	$48.00	$47.00	$47.00	$45.00	$44.40	$46.00	$40.00
1923.....	43.00	45.00	45.50	46.75	49.00	49.00	49.00	49.00	49.00	49.00	49.00	51.00
1922.....	35.00	34.00	33.00	34.15	34.70	37.00	37.00	37.30	40.00	43.00	43.00	43.00
1921.....	55.00	55.00	55.00	55.00	55.00	42.50	40.00	39.50	38.00	36.50	32.50	35.00
1920.....	60.00	64.50	66.00	67.00	70.00	70.00	70.00	70.00	72.40	74.00	74.00	74.00
1919.....	58.75	55.00	54.50	53.00	52.00	48.00	48.00	48.00	48.00	50.00	53.00	56.75
1918.....	49.00	49.00	49.00	49.00	50.20	55.00	55.00	55.00	55.00	60.00	60.00	60.00

Composite Market Record

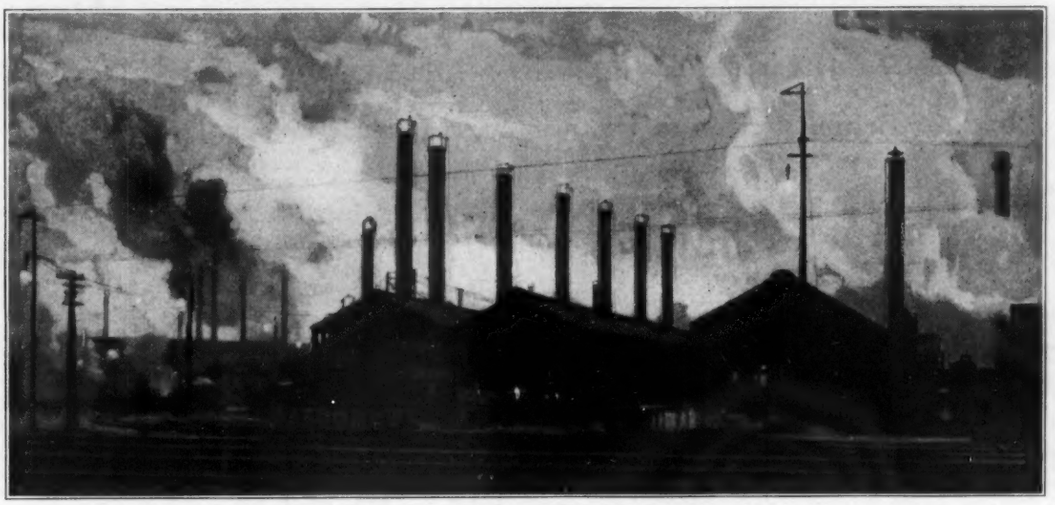
Weekly and Monthly Averages of Fourteen Iron and Steel Products, 1921-1924, Compiled by Iron Trade Review

1924		1923		1922		1921	
Dec. 10	$39.94	Dec. 26	$43.02	Dec. 27	$40.65	Dec. 28	$33.73
Dec. 3	39.58	Dec. 19	43.00	Dec. 20	40.54	Dec. 21	33.85
		Dec. 12	43.05	Dec. 13	40.23	Dec. 14	34.11
Nov. 26	39.46	Dec. 5	43.02	Dec. 6	40.69	Dec. 7	34.29
Nov. 19	39.21	Average for December	43.02	Average for December	40.53	Average for December	33.99
Nov. 12	38.79						
Nov. 5	38.56	Nov. 28	42.80	Nov. 29	41.40	Nov. 30	34.56
Average for November	39.00	Nov. 21	42.63	Nov. 22	41.78	Nov. 23	34.60
		Nov. 14	42.74	Nov. 15	42.41	Nov. 16	34.59
Oct. 29	38.61	Nov. 7	43.09	Nov. 8	42.72	Nov. 9	35.08
Oct. 22	38.65	Average for November	42.81	Average for November	42.08	Average for November	34.71
Oct. 15	38.65						
Oct. 8	38.67	Oct. 31	43.32	Nov. 1	43.08	Nov. 2	35.28
Oct. 1	38.67	Oct. 24	43.70	Oct. 25	43.42	Oct. 26	35.53
Average for October	38.65	Oct. 17	43.90	Oct. 18	43.56	Oct. 19	35.50
		Oct. 10	44.06	Oct. 11	43.88	Oct. 12	35.46
Sept. 24	38.87	Oct. 3	44.23	Oct. 4	44.07	Oct. 5	35.52
Sept. 17	38.95	Average for October	43.84	Average for October	43.60	Average for October	35.46
Sept. 10	39.15						
Sept. 3	39.23	Sept. 26	44.47	Sept. 27	44.26	Sept. 28	35.52
Average for September	39.05	Sept. 19	44.70	Sept. 20	44.18	Sept. 21	34.88
		Sept. 12	44.72	Sept. 13	43.80	Sept. 14	35.58
Aug. 27	39.35	Sept. 5	44.68	Sept. 6	43.79	Sept. 7	35.37
Aug. 20	39.37	Average for September	44.64	Average for September	43.79	Average for September	35.34
Aug. 13	39.31						
Aug. 6	39.29	Aug. 29	44.84	Aug. 30	41.41	Aug. 31	35.53
Average for August	39.33	Aug. 22	44.84	Aug. 23	40.92	Aug. 24	36.03
		Aug. 15	44.84	Aug. 16	39.69	Aug. 17	36.03
July 31	39.47	Aug. 8	44.88	Aug. 9	38.75	Aug. 10	35.82
July 24	39.53	Aug. 1	44.97	Aug. 2	38.16	Aug. 3	36.56
July 17	39.89	Average for August	44.87	Average for August	39.79	Average for August	35.99
July 10	39.91						
July 3	40.13	July 25	45.09	July 26	37.67	July 27	36.69
Average for July	39.78	July 18	45.26	July 19	37.45	July 20	37.55
		July 11	45.49	July 12	37.45	July 13	38.61
June 25	40.37	July 4	45.72	July 5	37.43	July 6	39.69
June 18	40.55	Average for July	45.39	Average for July	37.50	Average for July	38.14
June 11	40.66						
June 4	40.84	June 27	46.16	June 28	37.26	June 29	40.79
Average for June	40.61	June 20	46.34	June 21	37.12	June 22	41.23
		June 13	46.53	June 14	36.74	June 15	42.15
May 28	41.14	June 6	46.79	June 7	36.72	June 8	42.45
May 21	41.22	Average for June	46.46	Average for June	36.96	June 1	42.71
May 14	41.56					Average for June	41.87
May 7	41.58	May 30	47.26	May 31	36.64		
Average for May	41.38	May 23	47.44	May 24	36.62	May 25	43.03
		May 16	47.48	May 17	36.60	May 18	43.05
Apr. 30	41.72	May 9	47.70	May 10	36.50	May 11	43.59
Apr. 23	42.01	May 2	47.70	May 3	36.08	May 4	43.61
Apr. 16	42.47	Average for May	47.52	Average for May	36.49	Average for May	43.32
Apr. 9	42.55						
Apr. 2	42.91	April 25	47.34	Apr. 26	36.44	Apr. 27	43.73
Average for April	42.33	Apr. 18	47.15	Apr. 19	34.75	Apr. 20	43.85
		Apr. 11	46.87	Apr. 12	34.02	Apr. 13	43.93
Mar. 27	43.13	Apr. 4	46.69	Apr. 5	33.45	Apr. 6	43.86
Mar. 20	43.25	Average for April	47.01	Average for April	34.42	Average for April	43.84
Mar. 13	43.27						
Mar. 6	43.29	Mar. 28	46.55	Mar. 29	33.36	Mar. 30	44.57
Average for March	43.24	Mar. 21	45.33	Mar. 22	32.80	Mar. 23	44.85
		Mar. 14	44.95	Mar. 15	32.87	Mar. 16	45.25
Feb. 28	43.39	Mar. 7	44.41	Mar. 8	32.86	Mar. 9	45.53
Feb. 21	43.53	Average for March	45.31	Average for March	32.97	Mar. 2	46.65
Feb. 14	43.53					Average for March	45.37
Feb. 7	43.49	Feb. 28	43.81	Mar. 1	32.81		
Average for February	43.49	Feb. 21	42.57	Feb. 22	32.86	Feb. 23	47.10
		Feb. 14	42.24	Feb. 15	32.88	Feb. 16	48.36
Jan. 30	43.39	Feb. 7	41.83	Feb. 8	32.89	Feb. 9	49.00
Jan. 23	43.35	Average for February	42.61	Average for February	32.86	Feb. 2	50.78
Jan. 16	43.29					Average for February	48.81
Jan. 9	43.21	Jan. 31	41.61	Feb. 1	32.92		
Jan. 2	43.06	Jan. 24	41.41	Jan. 25	33.27	Jan. 26	51.28
Average for January	43.26	Jan. 17	41.13	Jan. 18	33.36	Jan. 19	51.73
		Jan. 10	41.05	Jan. 11	33.54	Jan. 12	52.14
		Jan. 3	40.67	Jan. 4	33.64	Jan. 5	52.75
		Average for January	41.17	Average for January	33.35	Average for January	51.98

Monthly Averages During Earlier Years

1920						1915		1913	
December	54.04	May	48.29	October	67.75	January	33.66	July	22.17
November	63.75	April	48.45	September	83.18	Average for year	40.50	June	22.58
October	68.61	March	52.28	August	89.69			May	22.99
September	69.28	February	53.71	July	89.56			April	23.39
August	68.93	January	53.81	June	82.66			March	23.60
July	68.29	Average for year	50.32	May	73.96			February	23.52
June	67.89			April	66.48			January	23.03
May	68.26	1918		March	61.07			Average for year	22.92
April	67.49	December	57.24	February	56.76				
March	65.47	November	55.67	January	55.10				
February	65.63	October	57.53	Average for year	70.10				
January	59.40	September	56.56						
Average for year	65.59	August	56.67	1916					
		July	56.66	December	$53.68				
1919		June	56.62	November	46.77				
December	54.88	May	56.59	October	41.50				
November	51.28	April	56.59	September	39.97				
October	48.76	March	56.71	August	39.67				
September	48.35	February	56.67	July	38.37				
August	48.27	January	56.67	June	39.63				
July	47.86	Average for year	56.68	May	39.78				
June	47.88			April	39.13				
		1917		March	37.18				
		December	56.68	February	35.63				
		November	58.29						

1914	
December	$21.58
November	23.39
October	22.84
September	23.17
August	22.72



From a Painting by Richard Jacks, R.A., for the London, Midland & Scottish Ry.

"The Steel Industry"

European Market Reviews for 1924

Reports by Iron Trade Review
Staff Correspondents

Great Britain
France
Belgium
Luxemburg
Germany

Austria
Czecho-Slovakia
Hungary
Poland
Russia

European Iron and Steel Export Prices in 1924

F. O. B. Ports of Shipment

British Prices in Pounds Sterling Per Gross Ton

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry, No. 3, Middlesbrough	4.19.0	4.18.0	4.10.0	4.12.6	4.12.0	4. 9.0	4. 8.0	4. 7.0	4. 3.0	4. 0.0	4. 0.0	4. 2.0
Basic, Middlesbrough	4.15.0	4.15.0	4.15.0	4.15.0	4.15.0	4. 7.6	4. 5.0	4. 0.0	4. 0.0	3.17.6	3.19.0	4. 0.0
Scotch Foundry	5. 5.0	5. 5.0	5. 0.0	5. 0.0	5. 0.0	5. 0.0	4.17.6	4.17.6	4.15.0	4.10.0	4.10.0	4.10.0
Hematite East Coast	5. 2.6	5. 1.0	4.19.0	4.19.0	4.18.6	4.17.0	4.16.0	4.14.0	4.12.6	4. 8.0	4. 7.0	4. 9.0
SEMIFINISHED STEEL												
Billets	7.15.0	7. 5.0	7.10.0	7.12.6	7.10.0	7. 0.0	7. 0.0	7. 0.0	7. 0.0	6.15.0	6.15.0	7. 0.0
Wire rods	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0
FINISHED STEEL												
Standard rails	8.15.0	8.15.0	8.10.0	8.10.0	8.10.0	8. 5.0	8. 7.6	8.10.0	8.10.0	8.10.0	8.10.0	8.15.0
Merchant bars	9.10.0	9. 0.0	9. 0.0	8.15.0	8.15.0	8.15.0	8.15.0	8.15.0	8.12.6	8.10.0	8.10.0	8.10.0
Structural shapes	9. 0.0	8.10.0	8.10.0	8. 7.6	8. 7.6	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0	8. 0.0
Plates, ship, bridge and tank	9. 0.0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	8.17.6	8.15.0	8.15.0
Sheets, black, 24 gage	13. 5.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	13. 0.0	12.10.0	12.10.0
Sheets, galvanized, 24 gage, corrugated	18. 5.0	18.10.0	17.15.0	17. 2.6	17.15.0	18. 5.0	18. 5.0	18.10.0	18. 5.0	17.10.0	17.10.0	17.10.0
Bands and strips	11. 5.0	11. 5.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0	11. 0.0
Plain wire, base	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	12. 5.0	12. 0.0	12. 0.0	12. 0.0	11.10.0	11.10.0	11.10.0
Galvanized wire, base	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	16. 0.0	15.10.0	15.10.0	15.10.0	15. 0.0	15. 0.0	15. 0.0
Wire nails, base	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0	14.10.0
Tinplate, base box 108 pounds	1. 4.3	1. 4.6	1. 4.6	1. 4.0	1. 2.7	1. 2.7	1. 2.7	1. 3.3	1. 3.6	1. 3.6	1. 3.6	1. 3.6
Furnace coke	1.17.6	1.10.0	1. 7.0	1. 6.0	1. 5.0	1. 2.6	1. 1.0	1. 0.0	1. 0.0	17.0	17.0	16.9
Ferromanganese	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	17. 0.0	16. 0.0	13.10.0	13.10.0	13.10.0	14. 0.0	14.10.0

German Prices in Pounds Sterling Per Metric Ton

F. O. B. Rotterdam or North Sea Ports

	Jan. £ s d	Feb. £ s d	March £ s d	April £ s d	May £ s d	June £ s d	July £ s d	Aug. £ s d	Sept. £ s d	Oct. £ s d	Nov. £ s d	Dec. £ s d
PIG IRON												
Foundry No. 3, Silicon 2.50-3.00	5. 0.0	4.13.0	4.13.0	4.15.0	5. 5.0	5. 5.0	5. 5.0	4.17.6	4.17.0	4.14.0	4.14.0	4.14.0
Basic	5.15.0	5. 3.0	5. 5.0	4.15.0	5.10.0	5.17.6	6. 0.0	5.12.6	5.10.0	5. 5.0	5. 5.0	5. 5.0
Hematite	5.15.0	5.11.0	5.10.0	5. 4.0	5.14.0	5.15.0	5.15.0	5.15.0	5.15.0	5.15.0	5.15.0	5.15.0
SEMIFINISHED STEEL												
Billets	6.10.0	6. 0.0	6.12.0	6.16.0	6. 5.0	6. 5.0	6. 2.6	6. 0.0	5.15.0	5. 0.0	5. 5.0	5. 7.0
Wire rods	8. 0.0	7.15.0	8.10.0	8.17.6	8.10.0	7.15.0	7.10.0	7. 0.0	7. 0.0	6.10.0	6. 8.0	6.17.0
FINISHED STEEL												
Standard rails	7.10.0	6.15.0	7. 5.0	7.17.6	8. 0.0	7. 5.0	6.12.6	6. 7.0	6.10.0	6. 0.0	6. 7.6	6.10.0
Merchant bars	7. 5.0	6.13.0	7. 5.0	7.17.6	7. 3.0	6.12.6	6.10.0	6. 2.0	6. 2.6	5.17.6	5.15.0	6. 5.0
Structural shapes	7. 2.6	6.13.0	7. 2.6	7. 9.0	7. 2.6	6.12.6	6.12.6	6. 5.0	6. 2.0	5.16.0	5.15.0	6. 0.0
Plates, ship, bridge and tank	8. 7.6	7.10.0	8. 5.0	8. 3.0	8. 2.6	7.12.6	7. 2.0	6.12.6	7. 5.0	7. 2.0	6.17.6	7. 5.0
Sheets, black, 24 gage	12. 0.0	12. 0.0	13. 0.0	13. 5.0	13. 5.0	14. 5.0	13. 2.0	12. 0.0	12. 7.6	12. 0.0	12. 2.0	12. 5.0
Sheets, galvanized, 24 gage, corrugated	18. 0.0	18. 0.0	18. 0.0	18. 0.0	18. 0.0	20. 0.0	22. 0.0	22. 0.0	22. 0.0	22.10.0	22.12.6	23. 0.0
Bands and strips	9.10.0	8.12.6	9.10.0	9.10.0	9.10.0	10.10.0	8.15.0	8. 3.3	8. 5.0	8. 5.0	8.15.0	9. 0.0
Plain wire, base	11.10.0	10. 0.0	10. 2.6	11.10.0	10.10.0	10. 2.6	10. 0.0	10. 7.6	10. 0.0	9.10.0	9. 2.0	9. 2.0
Galvanized wire, base	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	15. 0.0	17. 0.0	14. 0.0	12.10.0	11. 0.0	10.10.0	10.10.0
Wire nails, base	14.10.0	14.10.0	14.10.0	14.10.0	14. 0.0	14. 0.0	14. 5.0	13.10.0	13. 0.0	12. 7.6	10.17.0	11. 0.0

French Prices in French Francs Per Metric Ton

F. O. B. Channel Ports or Antwerp

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
PIG IRON												
Foundry No. 3, Silicon 2.50-3.00	390	385	405	405	380	360	355	335	315	305	320	340
Basic	395	395	410	415	390	380	355	335	315	310	325	340
Basic bessemer	395	385	405	410	380	360	350	320	305	305	315	330
Hematite, Phosphorus 0.02-0.05	440	465	520	500	465	440	435	430	425	415	415	420
SEMIFINISHED STEEL												
Billets	500	505	615	565	475	475	485	460	460	430	450	490
Wire rods	730	710	870	780	700	725	700	675	620	580	570	615
FINISHED STEEL												
Standard rails	545	575	620	630	600	580	575	520	515	510	505	510
Merchant bars	570	570	700	645	580	560	555	565	545	500	510	545
Structural shapes	555	575	660	605	560	555	540	520	520	490	505	505
Plates, ship, bridge and tank	635	635	750	745	710	735	730	720	730	710	710	710
Sheets, black, 24 gage	1100	1100	1200	1200	1150	1150	1150	1225	1150	1200	1200	1250
Sheets, galvanized, 24 gage, corrugated	1540	1610	1700	1750	1800	1750	1750	1750	1770	1770	1700	1710
Bands and strips	775	775	960	900	815	825	800	800	730	710	710	700
Plain wire, base	955	915	1225	1025	1000	975	1020	1020	1010	930	920	960
Galvanized wire, base	1225	1175	1475	1325	1300	1325	1300	1300	1320	1220	1220	1255
Wire nails, base	1090	1025	1275	1125	1050	1100	1100	1100	1100	1010	1000	1035

Belgian Prices in Belgian Francs Per Metric Ton

F. O. B. Antwerp

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
PIG IRON												
Foundry, No. 3, Silicon 2.50-3.00	410	430	485	450	395	400	390	365	340	340	350	370
Basic	430	430	490	465	400	390	380	345	340	340	350	370
Basic bessemer	410	410	470	460	390	380	370	355	330	320	335	360
SEMIFINISHED STEEL												
Billets	565	595	705	610	540	560	545	510	490	465	500	530
Wire rods	810	840	925	850	750	775	700	670	620	600	615	650
FINISHED STEEL												
Standard rails	700	695	695	650	680	700	700	600	600	600	610	610
Merchant bars	670	690	800	675	600	620	595	560	525	515	555	575
Structural shapes	615	650	760	660	590	610	585	550	525	515	530	550
Plates, ship, bridge and tank	730	790	845	800	725	740	730	665	635	630	640	675
Sheets, black, 24 gage	1200	1245	1375	1200	1210	1275	1260	1260	1200	1180	1225	1250
Sheets, galvanized, 24 gage, corrugated	2000	2050	2125	2100	2100	2450	2325	2250	2150	2225	2240	2250
Bands and strips	950	950	950	950	950	925	900	830	775	735	750	775
Plain wire, base	1200	1200	1400	1260	1150	1075	1075	1000	950	900	840	850
Galvanized wire, base	1500	1500	1675	1525	1400	1325	1325	1250	1200	1150	1090	1100
Wire nails	1250	1250	1450	1300	1150	1125	1125	1050	1000	910	845	850

Europe Gropes Toward Stability

Hopes Are Expressed That Good Progress Will Be Made in the New Year—Production Now Nearly Up to Prewar Level—Prices Have Been Erratic—Germans Form Sales Syndicate

BY VINCENT DELPORT
European Manager, Iron Trade Review

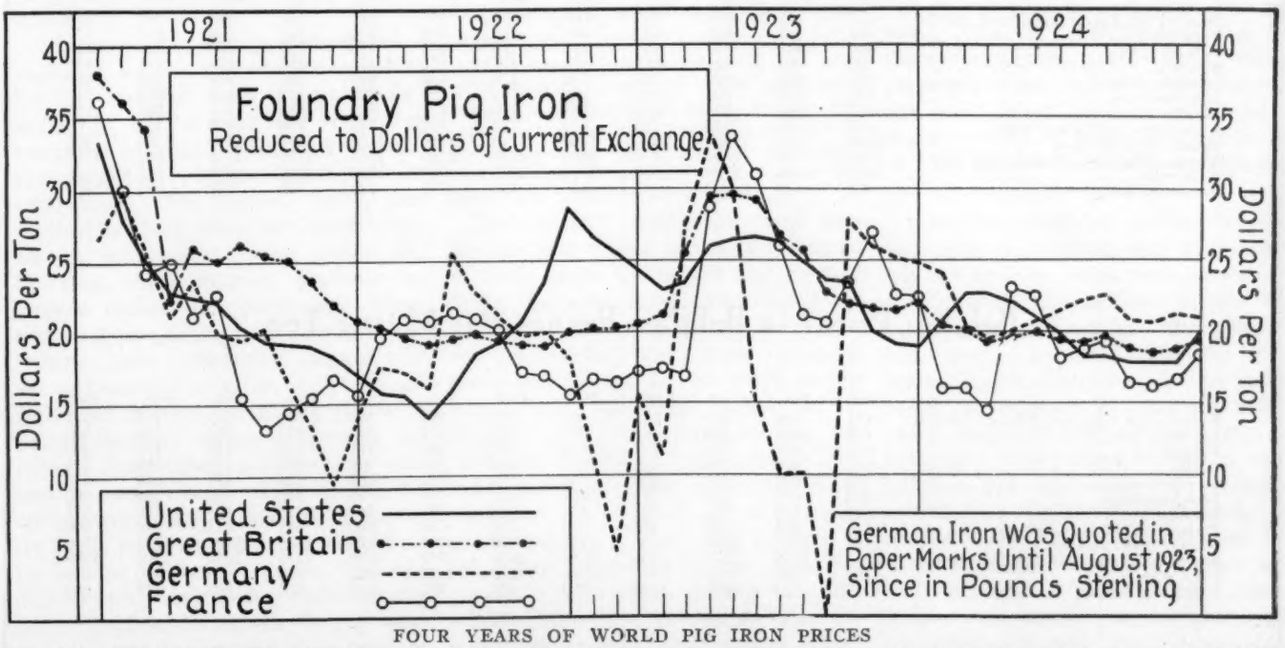
THE year 1924 was one of dire struggle by European industries to maintain their markets in the face of increasing competition. As the year drew to a close, a strong desire to reach some kind of international understanding in order to stabilize prices and control production became evident among iron and steel producers. However, this path is bristling with difficulties and it is not likely that the new year will see the birth of a real international syndicate.

The past year was characterized by instability of iron and steel prices and excessive production. All through the year continental prices were considerably lower than those prevailing in Great Britain and imports of continental material in England were heavy. British steel also encountered severe competition in the empire's own export markets. As a result, British prices gradually dropped from the beginning of 1924 until November when, following the elections, they again climbed up. Their lower prices, under favorable circumstances, enabled British exporters to ship tonnages of pig iron to the United States. French and Belgian prices were ever changing. German prices also shifted. These variations were the result of unstable exchange rates.

The continental output of iron and steel in 1924 considerably exceeded that of preceding years. France and Belgium, with new, up-to-date plants, outdid their prewar production. Germany, by extending her plants, reached a level of production which may be estimated to equal if not exceed that of Great Britain. The combined raw steel steel production of Great Britain, France, Belgium, and Luxemburg in 1924 can be estimated at between 28,000,000 and 30,000,000 gross tons as compared with 33,360,000 tons in 1913. Such conditions justify the feeling already alluded to, that "something must be done." It can be assumed that currencies will not be subjected to such wide fluctuations in 1925 as in the preceding year. Sterling is sound. The mark, protected by the Dawes scheme and supported by the successful floating of the German external loan, appears to be enjoying a firm tendency. The French franc is now backed up by the recent hundred-million dollar loan and the Belgian franc will be correspondingly maintained. These conditions eliminate one of the main causes of European iron and steel price variations.

The problem of organization international iron and steel associations with a view to controlling production and stabilizing prices remains to be solved. Eventually a combination of Lorraine ore and Westphalian coke interests will be brought about. In the meantime Germany alone has formed a domestic syndicate for the control of the production of raw steel, but it is unlikely that other countries will follow suit. Negotiations of a more general character are now being pursued between Germany, Great Britain, France and Belgium, and the economic struggle is resuming one of its old aspects of tariff skirmishes.

After having traveled a rocky road for several years, European industries were in a more healthy condition at the close of the year than might have been hoped for. The vitality of the iron and steel industries in these countries is such that the United States may be prepared to find its European competitors this year as strong as in the past, while British pig iron and ferromanganese, and continental steel will still find their way to American ports throughout 1925.



FOUR YEARS OF WORLD PIG IRON PRICES

This Chart Shows Southern No. 2 Foundry at Birmingham, French Lorraine No. 3 Foundry; German No. 3 Foundry at Furnace; and British No. 3 Foundry at Middlesbrough, All Reduced to Dollars According to the Monthly Fluctuations in Exchange

European Iron and Steel Domestic Prices in 1924

British Prices in Pounds Sterling Per Gross Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
Foundry No. 3 pig iron, Silicon 2.50-3.00	4.18.6	4.13.0	4.12.0	4.12.6	4.10.0	4. 8.0	4. 7.0	4. 3.6	4. 2.0	4. 0.0	4. 2.0	4. 2.0
Basic pig iron	4.15.0	4.15.0	4.15.0	4.15.0	4.10.0	4. 5.0	4. 0.0	4. 0.0	3.17.6	4. 0.0	4. 0.0	4. 0.0
Furnace coke	1. 7.6	1. 8.0	1. 5.0	1. 5.0	1. 3.0	1. 1.0	1. 0.0	1. 0.0	17.0	17.0	17.0	16.9
Billets	7.10 0	7.10.0	7.15.0	7.10.0	7. 0.0	7. 0.0	7. 0.0	7. 0.0	6.15.0	6.15.0	6.15.0	7. 0.0
Standard rails	9. 0 0	9. 0 0	9. 0.0	9. 0.0	8.15.0	8.10.0	8.10.0	8.10.0	8.10.0	8.10.0	8.10.0	8.15.0
Merchant bars	9.10 0	9.10.0	8.17.6	9. 0.0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	8.15.0	8.15.0	8.15.0	8.15.0
Shapes	10. 0.0	9.10.0	9.10.0	9.10 0	9. 0.0	9. 0.0	9. 0.0	9. 0.0	8.15.0	8.10.0	8.10.0	8.10.0
Plates, ship, bridge and tank	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9.10.0	9. 5.0	9. 5.0	9. 5.0
Sheets, black, 24 gage	13.10 0	13.10.0	13.10.0	13.10 0	13.10.0	13.10.0	13.10.0	14. 0.0	14. 0.0	13. 0.0	13. 0.0	13. 0.0
Sheets, galvanized, 24 gage, corrugated	18. 5 0	18.10.0	17.15.0	17. 2.6	17.15.0	18. 5.0	18. 5.0	18.10.0	18. 5.0	17.10.0	17.10.0	17.10.0
Plain wire	14. 0.0	14. 0.0	14. 0.0	14. 0.0	14. 0.0	12. 5.0	12. 0.0	12. 0.0	12. 0.0	11.10.0	11.10.0	11.10.0
Bands and Strips	12. 0.0	12. 0.0	12. 0.0	12. 0.0	12. 0.0	12. 0.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0	11.10.0

German Prices in Renten Marks Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
Foundry No. 3 pig iron, Silicon 2.50-3.00	84	87	89	91	99	99	92	92	92	88	88	88
Basic pig iron	95	98	98	100	105	110	105	105	105	98	98	98
Furnace coke	34	32	32	32	32	32	27	27	27	24	24	24
Billets	110	115	125	130	125	115	105	95	105	100	105	112
Standard rails	126	125	140	155	145	135	125	115	120	120	135	135
Merchant bars	126	127	140	155	145	130	120	115	118	110	117	122
Shapes	124	125	133	147	145	126	121	112	116	109	115	117
Plates, ship, bridge and tank	150	140	160	160	155	140	135	130	138	128	137	137
Sheets, black, 24 gage	225	225	240	245	240	230	220	218	220	215	220	225
Sheets, galvanized, 24 gage, corrugated	345	345	340	345	350	470	460	400	420	435	435	445
Plain wire	190	190	190	200	200	180	160	160	170	160	155	160
Bands and Strips	163	160	175	190	195	170	160	160	162	145	160	160

French Prices in French Francs Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
Foundry No. 3 pig iron, Silicon 2.50-3.00	385	385	405	405	385	375	345	315	305	300	305	310
Basic pig iron	385	385	405	405	385	375	345	315	305	300	305	310
Furnace coke	145	142	142	145	148	150	148	148	150	150	148	145
Billets	500	505	615	575	490	475	455	455	455	425	425	435
Standard rails	545	580	620	620	590	575	550	495	505	460	460	460
Merchant bars	570	570	700	700	590	575	590	585	545	515	505	520
Shapes	555	560	675	675	575	570	575	540	515	485	480	500
Plates, ship, bridge and tank	635	630	750	775	700	730	735	725	730	710	710	700
Sheets, black, 24 gage	1150	1150	1300	1300	1200	1150	1150	1200	1175	1200	1200	1200
Sheets, galvanized, 24 gage, corrugated	1750	1750	1800	1850	1850	1750	1750	1765	1770	1770	1685	1700
Plain wire	1000	1000	1100	1085	1000	1075	990	1020	1010	935	935	970
Bands and Strips	855	850	900	955	825	825	815	810	740	710	685	700

Belgian Prices in Belgian Francs Per Metric Ton

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Foundry No. 3 pig iron, Silicon 2.50-3.00	415	425	485	465	400	405	395	360	345	345	355	375
Basic pig iron	410	415	470	460	405	385	375	345	330	325	340	365
Furnace coke	195	195	195	195	190	190	160	155	145	135	135	135
Billets	565	600	705	615	545	560	540	515	495	470	505	535
Standard rails	700	695	695	690	690	750	750	600	625	650	610	610
Merchant bars	670	690	800	745	600	620	595	595	540	525	560	600
Shapes	615	675	760	710	590	605	585	565	535	515	550	575
Plates, ship, bridge and tank	730	800	840	850	710	755	730	700	645	625	670	700
Sheets, black, 24 gage	1325	1325	1400	1400	1275	1300	1300	1275	1225	1200	1275	1300
Sheets, galvanized, 24 gage, corrugated	2350	2350	2375	2200	2450	2450	2350	2250	2175	2250	2300	2800
Plain wire	1200	1200	1400	1375	1150	1075	1075	1025	950	900	850	850
Bands and Strips	975	975	1050	1100	1000	925	880	840	800	760	775	800

British Home Market Invaded

Pig Iron and Finished Steel from Continent Competed Severely with Domestic Product—Indian Tariff on Steel Also Hurt Market—Prices Decline Slowly Throughout Year and Fall Below Profit Point

IN THE iron and steel trade, 1924 was generally disappointing, having failed to realize the optimistic expectations held at the beginning of the year. The period was one of falling prices, fairly evenly distributed over all classes of production. The reductions, however, were slowly progressive and consequently have not entailed risks of serious loss. Selling prices have, however, now reached a point at which profit-making is practically impossible, and ideas of profit have been indefinitely postponed, although at the moment, the position is rather more hopeful.

The year began badly with a railway strike, which reduced the working furnaces in January to 190. The best pig iron production of the year was in March, when the output was 668,600 tons. But in that month there were only 194 furnaces at work. Other labor troubles, in addition to the strike, included an extensive stoppage of steelworks at Sheffield and a shipbuilding lockout which extended over several months. Almost the only satisfactory product from the manufacturers' point of view relates to furnace coke, which in the ten months reduced from £1 7s 6d ($5.90 at the current rate of exchange) at the furnaces to 17s ($3.95) mainly on account of reduced continental demands, coinciding with larger production; although it was affected also, unfortunately by a steadily falling blast furnace demand.

The severity of foreign competition is indicated by the import figures, which for the most part were on an ascending scale. It will be seen that very large quantities of basic pig iron were bought abroad, and steel billets were formidable competitors. The highest figure was reached in May when the steel billets blooms, etc., bought abroad totalled 83,814 tons. Such Belgian products as girders, beams, etc., plates and sheets, and steel bars figure prominently in the returns. This competition was aided by the extremely low rates of exchange, giving an inflated purchasing power to British sterling. As usual, however, the foreign semifinished material was utilized, to some extent, by increasing the competitive power of makers of sheets, tin plate, bars, etc., to retain their hold on foreign markets. Almost the only departments maintaining substantially full production throughout the year were galvanized sheets and tin plate, both of which show excellent export returns.

A good volume of exports was maintained, May being the most satisfactory month; but the severe slump which reached its lowest point in September is indicated by the fall from a total of 415,115 tons in May to 269,279 in September. Pig irons had remarkably wide fluctuations, and in September it will be seen, that the imports of pig iron came very near the total of exports. For some months in the year pig iron was dumped into Middlesbrough, into the yards of important steelworks, whose furnaces were idle. One of the misfortunes which affected several branches of British trade was the imposition of the Indian tariff, which has checked exports, especially from Middlesbrough, a district which for many years has regarded India as its most useful market. The October exports show a decided revival, and the last two months of the year promised to do something in making up the heavy leeway resulting from the unsatisfactory earlier months. In October, for the first time for five months, the Tees exports of iron and steel exceeded 100,000 tons.

Capacity Exceeds Consumption Needs

It should not be forgotten that the keen competition and large proportion of unemployment is distinctly connected with the large increase in capacity. The National Federation of Iron & Steel Manufacturers in December last year pointed out:

It is recognized that the 50 per cent expansion in iron and steel producing capacity, which took place during the war cannot be fully utilized except in boom periods, until normal consumption both for home and export is developed to a corresponding level.

The capacity steadily increased during the year owing to the laying down of large plants by Scotch and English firms, the latest development being the complete overhauling of the Northeastern Steelworks, which has occupied many months and is now ready to operate. With the larger number of individual mills capable of turning out 4000 tons of steel rails per week or 3000 tons of ship or other plates, the trade has now, so to speak, a wide mouth which requires a good deal to keep it fed. This explains why the sharp recovery in the volume of business which followed the general election was accompanied by great steadiness of prices, no advance whatever having taken place in steel rates at the time of writing. This is the penalty which the industry has to pay for its zeal in bringing plants up to war requirements. Shortness of money the world over has prevented the various countries from supplying their iron and steel needs. Consequently, the change over to peace requirements has not even now been effected.

Further progress has been made in the direction of increasing the output per man and generally speeding up time wasting being the special bete noir of the steel manager.

The most serious deficiency was the lack of orders for shipbuilding, which must necessarily be the most reliable customer of the steelworks. Naturally also, the chief mill improvement and extension has had in view the requirements for shipbuilders, the layouts providing for maximum daily and weekly tonnages. The following table shows the ship building tonnages for the first three quarters of the year:

	—1912—		—1924—	
Quarter of year	Tonnage under construction at end of quarter tons	Tonnage commenced tons	Tonnage under construction at end of quarter tons	Tonnage commenced tons
First ..	1,492,138	355,203	1,473,629	227,786
Second	1,337,759	241,183	1,516,746	375,210
Third .	1,271,195	111,860	1,468,408	252,745
Fourth	1,395,181	244,506	.....	.....

The latest unemployment returns for shipbuilding show a proportion of men out of work of no less than 28.5 per cent. This is largely accountable for the continued high percentage of unemployment in the kindred industry of iron and steel, blast furnacemen having a proportion out of work in September of 16 per cent, iron and steel workers 24.9 and iron ore mining 22.9.

Common complaints during the year were that shipbuilding and ship repairing can be done much more cheaply on the Continent than in Great Britain. The reasons assigned are the comparatively high cost of iron and steel and other materials and especially the stringent conditions imposed by the trade unionists in regard to working hours, apprentices, etc. The various classes of shipbuilders and engineers were agitating continuously, practically all the year, for higher wages. Their dissatisfaction has some reasonable foundation, since several branches of industry pay higher wages to unskilled workers than are paid to skilled engineers and shipbuilders.

This is one of the legacies from the war period, the large proportion of labor representatives in the various municipal bodies keeping a watchful eye on wage questions and maintaining a stubborn fight against any reduction. A common ground of complaint is that the ordinary railway porter, whose duties are largely unskilled, can make more money than several classes of work people engaged in skilled industries.

The workman has, of course, had to take his share of the depression, with it unfortunate results of his wages. In December of last year the average weekly earnings per head in iron and steel amounted to £3 3s 3d ($13.60) whereas for September this year the average was £2 18s 8d ($13.50). Complaints were general throughout the year in every branch of the iron and steel industry that this country is severely handicapped by the return, on the Continent, to the prewar 10-hours and 12-hours system of working, and the generally lower wages earned by the foreigners. This has been a common accusation against the influence of British trade unions which it is said agitate for the maintenance of incompetitive wages. The workmen's representatives, however, have nothing better to offer than a promise to induce the workers on the Continent to line up to English conditions. The steel trade has undoubtedly suffered from the small individual output of the coal miner, now very much less than it was before the war and capitalists engaged both in coal, iron and steel repeatedly have contended for some modification of the 7-hours system in the pits which would add to the output of coal while reducing its cost. Occasionally manufacturers have spoken out sharply on the difficulty of meeting competition with tariff countries and have called for retaliatory measures; but it cannot be said that any progress has been made in the direction of a tariff policy, and even in the iron and steel trades such pronouncements are rather suggestive of the voice crying in the wilderness. The trade is as divided as ever on all questions of tariffs. It will be remembered that prior to the election, Stanley Baldwin, who was a former chairman of Baldwins Ltd., and who is extremely well informed on iron and steel conditions, expressly repudiated any intention of introducing general tariffs without a definite and special mandate from the country. Probably, the policy of preferential arrangements with the Colonies and some judicious restoration, possibly expansion of the Safeguarding of Industries Act, would find very much support in the iron and steel trade.

The general position of the industry is indicated from the point of view of capital investments. The September returns of coal and pig iron companies showed a paid up ordinary capital of £6,451,231 with a market value of £9,234,709. For coal, iron and steel companies the paid up capital was £42,431,120 of a market value of £25,196,877. Iron, steel and engineering companies had a paid up ordinary capital of £35,396,696 with a market value of £30,835,206.

Taking the nominal value of the investments at £100 iron and coal companies in December last had a value of 124.7 which in September had increased to 143.2. In the same period, however, iron, steel and engineering companies had reduced from 108.9 to 59.4. But iron and steel companies had increased from 76.0 to 87.1. A further improvement has taken place since the election and demand for iron and steel shares is decidedly encouraging, indicating far more confidence in the future than has been manifested for the past two years, at least.

Exports in Gross Tons During 1924

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.
Scrap	7,731	10,988	11,539	4,493	8,196	10,343	8,051	5,775	5,471	4,715
Pig Iron:										
Forge and foundry	21,075	24,598	15,513	24,780	44,078	23,556	19,625	20,355	13,897	23,784
Acid	15,774	8,679	12,799	23,978	31,671	17,236	15,916	13,609	12,164	17,707
Basic	2,279	5	15	.....	.....	.....	.....	26	33	50
Ferroalloys	8,592	7,710	8,086	14,424	10,548	5,740	8,711	7,254	9,349	12,419
Steel Ingots	164	85	16	174	142	61	60	71	.....	33
Blooms, billets, slabs	795	647	1,234	1,087	1,177	1,167	747	1,581	445	454
Bars, rods, angles, shapes, etc	31,379	29,032	20,958	26,693	28,117	25,184	29,431	26,708	25,137	23,073
Castings, iron	98	76	116	93	117	154	123	228	127	153
Castings, steel	1,378	33	117	65	96	71	105	61	68	54
Forgings, iron	8	8	7	2	14	20	5	6	3	6
Steel girders, beams, etc	7,932	6,193	5,136	5,938	6,845	7,262	6,333	4,755	4,995	6,210
Hoops and strips	6,109	5,394	5,187	5,047	4,580	6,942	3,825	7,590	4,931	7,305
Plates and sheets, not gal.:										
Armor plates	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plates and sheets not under ⅛" thick	11,687	15,727	12,496	14,216	17,222	20,146	18,844	19,228	14,443	10,510
Plates and black sheets under ¼" thick	26,900	24,565	23,128	14,614	24,615	23,121	27,334	19,229	13,916	16,763
Black plates	3,439	1,974	1,753	2,671	3,406	4,751	7,481	5,082	2,627	4,440
Plates and sheets, coated:										
Galvanized sheets	54,809	50,460	50,310	59,020	66,018	50,818	57,108	48,937	52,014	55,034
Tin plate	51,704	44,962	46,137	49,542	60,480	50,809	46,867	40,821	42,492	45,776
Cast tubes, pipes and fittings	5,201	6,431	6,417	7,956	7,095	6,953	9,058	8,127	7,270	6,679
Wrought tubes, pipes and and fittings	11,669	13,969	13,806	9,477	13,896	15,530	17,692	16,466	9,806	12,581
Rails for trams	601	1,270	2,026	1,103	262	724	717	214	189	1,107
Railway rails	21,841	24,755	13,934	9,503	21,670	10,515	12,526	14,100	9,325	11,299
Sleepers and fishplates	11,738	8,853	6,418	17,408	9,208	8,642	4,984	5,694	3,297	7,160
Tires and axles	1,865	2,683	1,838	1,692	1,963	1,484	1,629	1,616	1,661	1,354
Wheels and axles	1,314	2,448	2,318	1,624	1,097	1,195	1,122	1,522	619	1,290
Railway mat., other types	6,341	6,781	3,814	5,674	5,611	4,543	2,154	2,711	2,708	5,579
Wire	5,231	5,805	5,336	6,750	7,886	6,782	7,580	5,904	5,717	7,140
Wire manufactures	4,109	3,816	3,928	4,074	4,729	4,407	4,320	4,488	4,238	4,476
Nails and tacks	1,346	1,334	1,396	903	1,207	1,475	2,250	1,773	1,322	1,396
Wood screws	599	331	309	292	345	235	256	248	222	293
Bolts and nuts	2,186	2,337	1,860	2,268	2,300	2,736	2,721	2,631	2,253	2,770
Manufactures of cast iron	1,769	3,168	2,431	1,519	2,293	2,391	3,262	2,326	2,396	2,646
Anchors, cables and chains	1,252	1,219	1,195	1,837	1,694	1,407	1,147	1,264	1,260	1,395
Bedsteads and finished pts.	1,100	824	945	926	1,199	1,182	1,021	1,123	946	1,131
Hollow ware	1,366	1,629	1,375	1,585	1,628	1,409	1,691	1,571	1,564	1,592
Other manufactures of iron and steel	12,982	21,301	14,971	18,201	22,881	14,498	17,982	12,668	11,380	14,488
Total, including scrap	345,455	341,511	299,691	341,292	415,115	334,775	347,799	306,832	269,279	313,920

France's Fortunes on Upgrade

Great Industrial Improvement Reflected in Gain of 61 Per Cent in Pig Iron Production, 49 Per Cent in Steel—Exports Exceed All Past Records—Relations with Germany More Satisfactory

BY L. W. MOORE
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THE year 1924 will be recorded in the history of French iron and steel industry as one of real progress and accomplishment. The beginning of a new era in French metallurgy was marked by the armistice with which came the return of Lorraine to France. Following the close of hostilities many months were spent in rebuilding the furnaces and mills ruined by the war.

The work of co-ordinating and organizing the newly acquired interests in Lorraine also took considerable time and it was not until 1921 that France was really prepared to resume her place as a factor in the iron and steel trade of the world. Iron and steel producers, even in countries where the industry was well organized and enjoying well established trade connections, at home and abroad, will long remember the business depression which prevailed during the last half of 1921 and all of 1922.

In the face of such conditions losses were inevitable and the financial reports of practically all of France's iron and steel manufacturers disclosed large deficits for this period. As business began to move forward toward the close of 1922 the outlook became more encouraging. Early in 1923 France began to enjoy an active export demand and then French troops were ordered to move into Germany and occupy the Ruhr. This move dealt a hard blow to French metallurgy as it took many months to overcome the passive resistance of the Germans and assure an ample and regular supply of Ruhr coke to Lorraine and eastern furnaces.

It is true that political disturbances and exchange fluctuations which persisted during 1924 were not favorable to business development, but these handicaps were not comparable to the obstacles which had confronted the steel industry during the five preceding years.

During the first six months of 1924 French blast furnaces produced 3,786,179 metric tons of pig iron which is an increase of 1,429,264 tons or 60.6 per cent over the output for the corresponding period of 1923. The year started off with 127 furnaces blowing which produced 589,000 tons during January or 20,000 tons more than was produced during any one month in 1923. Additional stacks were blown in as the year progressed, and the output increased steadily until the average monthly production toward the close of the year was 650,000 metric tons.

According to statistics published by the Comite des Forges, 3,395,261 tons of steel were manufactured in France during the first six months of 1924. Of this total, 3,312,729 tons were steel ingots and 82,532 tons steel castings. This is an increase of 1,123,805 tons or 49.4 per cent over the production during the first half of 1923 and 24.5 per cent more than the output for the last half.

Exports of iron and steel for the year 1924 exceeded all past records. Shipments to foreign destinations were greatly accelerated during the months of February, March and April, due to the unusually low value of the French franc. During the first eight months of 1924 pig iron exports averaged 61,000 tons per month as against 49,400 tons monthly for 1923. Steel exports averaged 193,000 tons during the first eight months of 1924 as compared with the 1923 monthly average of 153,850 tons. Average monthly imports of pig iron fell from 5300 tons in 1923 to 4000 tons in 1924, whereas imports of steel products increased slightly.

Reparations Deliveries Were Regular

Deliveries of coke by Germany on the reparations account were made regularly throughout the year and French blast furnace operators were constantly provided with a sufficint supply of combustibles. This fact accounts, in a large measure, for the marked improvement in the iron and steel industry for 1924 over previous post war years. During the first eight months of 1924 France imported 3,876,326 tons of coke, most of which came from the Ruhr cokeries. This represents a monthly average of 484,541 tons as compared with 302,500 tons for 1923.

French coke ovens produced 1,726,319 tons of coke from Jan. 1 to Sept. 1, 1924, or an average of 215,789 tons monthly. Thus coke receipts from all sources attained a monthly average of 690,330 tons while statistics for 1923 show an average of only 450,000 tons per month. It is estimated that under normal conditions the French iron and steel industry requires a minimum of 700,000 tons of coke per month.

The price o reparations coke was fixed for January at 220 francs ($11) per metric ton. This figure was reduced on Feb. 1 to 143.50 francs ($7.18) at which point it remained practically unchanged throughout the year.

French metallurgists are high in their praise for the results accomplished by the Mission Interalliee de Controle des Usines et des Mines. This mission was composed of several experts representing the allies during the period of Ruhr occupation. When it became obvious that the Germans were going to resist occupation by subsidizing labor and refusing to operate their industries in the Ruhr means had to be taken by the allies to exploit the Ruhr mines and furnaces and organize transportation.

This work was performed by the Micum and the success of their efforts is attributed in a large measure to their decision to ignore the German government and to negotiate directly with the owners of the Ruhr mines and steel plants and other industries.

Adjustments of pig iron prices were less frequent during 1924 than in other years since the war. Lorraine No. 3 foundry pig iron was quoted at 395 francs ($19.75) in January and remained practically unchanged at this figure until July when it began to go down slowly, reaching its lowest point in October when it was quoted at 295 francs ($14.75) per metric ton f.o.b. furnace. Hematite iron quotations averaged 100 francs ($5) per metric ton over the price of phosphorus pig iron throughout the year. Concessions were made from time to time to obtain export tonnage. During February and March orders were booked for shipment to the United States, but as prices began to decline in America and the French franc appreciated in value shipments in this direction ceased, but other outlets were maintained. During the last half of the year exports of pig iron were confined largely to Belgium, Italy and Switzerland.

Makers of semifinished steel products enjoyed a brisk export and domestic demand throughout the year. As in the past, Belgium and Luxemburg proved to be France's best foreign customers. Their combined purchases of blooms, billets and bars totaled 348,075 metric tons during the first six months of 1924. Great Britain took 200,000 tons, Germany 100,-

000 tons and exports to other countries approximated 100,000 tons during this period.

The largest single item appearing on the list of France's iron and steel exports is rails. Shipments to other countries totaled 161,689 tons during the first half of 1924 as compared with 110,076 tons for the corresponding period of 1923.

Little buying has been done by the French railways since the war and although they were expected to come into the market for large tonnages during 1924 their orders have been disappointing. Exports of finished steel products, other than rails, amounted to 161,742 tons or an increase of 70,000 tons over the corresponding period of six months during 1923. Makers of heavy plates encountered keen competition from Belgian mills. The situation as regards light plates and sheets was more satisfactory and mills making 3/16-inch gage and lighter worked to capacity throughout the year. Manufacturers of butt-weld pipe handled all their domestic sales through the selling syndicate known as the Comptoir pour lavente des Tubes Soudes par Rapprochement. The average selling price at the beginning of the year for sizes ⅛-inch to 2 inches was fixed by the comptoir at 1500 francs ($75) per metric ton. This price prevailed until August when the comptoir announced a slight increase. Two small advances were made subsequently, bringing the price up to 1600 francs ($80) per ton at the end of the year. The consumption of wrought pipe is increasing steadily in France and pipe mills are enjoying a prosperous business. Before the war lead pipe was used almost exclusively in plumbing installations but the high price of this product is gradually leading to the adoption of galvanized steel pipe. French manufacturers find that they can make large pipe practically as cheap by the seamless process as by the lap welding method and this accounts for the relatively heavy consumption of seamless pipe in France.

The various export selling organizations which were constituted after the dissolution of the comptoirs to handle export business continue to play an important role in France's foreign trade. The most important of these bureaus are Longovica, Nortrilor, Sogeco and Columeta. The latter is a Luxemburg organization with offices in Paris. Practically all sales of iron and steel in the French colonies are handled by the Compagnie de Depots et Agences de Vente d'Usines Metallurgiques.

French steelmakers encouraged by the results of the past year look forward to the future with optimism. They firmly believe that the most difficult period now lies behind them. Moreover it has become much easier to find capital for expansion than ever before. Prior to the war French capitalists favored government bonds as investments but the Russion debacle and conflicts in Turkey have cost French investors billions of francs. Their attention has thus been turned to industrial stocks just when the French iron and steel industry most needed the financial support of her own people. The next step predicted toward consolidating the position of the metallurgical industry is an accord between France and Germany, under which Lorraine ore can be traded for Ruhr coke. Negotiations with this object in view are now being pursued and if successfully terminated will mark the opening of a new chapter in the history of French industry. However some time will elapse before such negotiations are successfully concluded and the leading French industrialists are aware that the interests of neighboring iron and steel producing countries are also involved and that some kind of a general settlement must be arrived at.

At the close of the year the French steel trade awaist consummation of the pact with Germany for the exchange of ore and coke, the outline for which has been drawn up and is under consideration by industrial leaders of both nations| Indications are for an early understanding on this important feature of steelmaking and that this bar to production by both nations will be removed speedily. It seems probable that the first agreement will not go further than formulating a basis for exchange of these raw materials and rumors that price agreements and outlining of markets would be included are not believed to be founded on fact. The importance of an understanding on this point is recognized by both countries and no reason seems to exist to interfere with an easy solution of the difficulty that has hampered France and Germany because of the need each has for the material controlled by the other.

A representative gathering of business men representing 39 countries, including a large delegation from the United States, will meet in Brussels June 21 to 27, next, to discuss world economic conditions and problems, which will be taken up at the third general meeting of the International Chamber of Commerce, according to announcement by the American section of the international chamber.

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As a premilinary to the Brussels meeting, an international committee composed of able business men of all the important commercial nations of the world will make an economic world survey for the purpose of determining what measures must be taken to solve the problems that will arise in the wake of the operation of the Dawes plan and to stimulate production, revive industry and restore international trade. To this end the committee on economic restoration of the international chamber, of which Fred I. Kent, New York banker, is chairman, will be enlarged by the addition of members from the countries now represented and from other countries which play an important part in international trade. The committee will begin to function early next year, so that its report will be ready in time for the meeting.

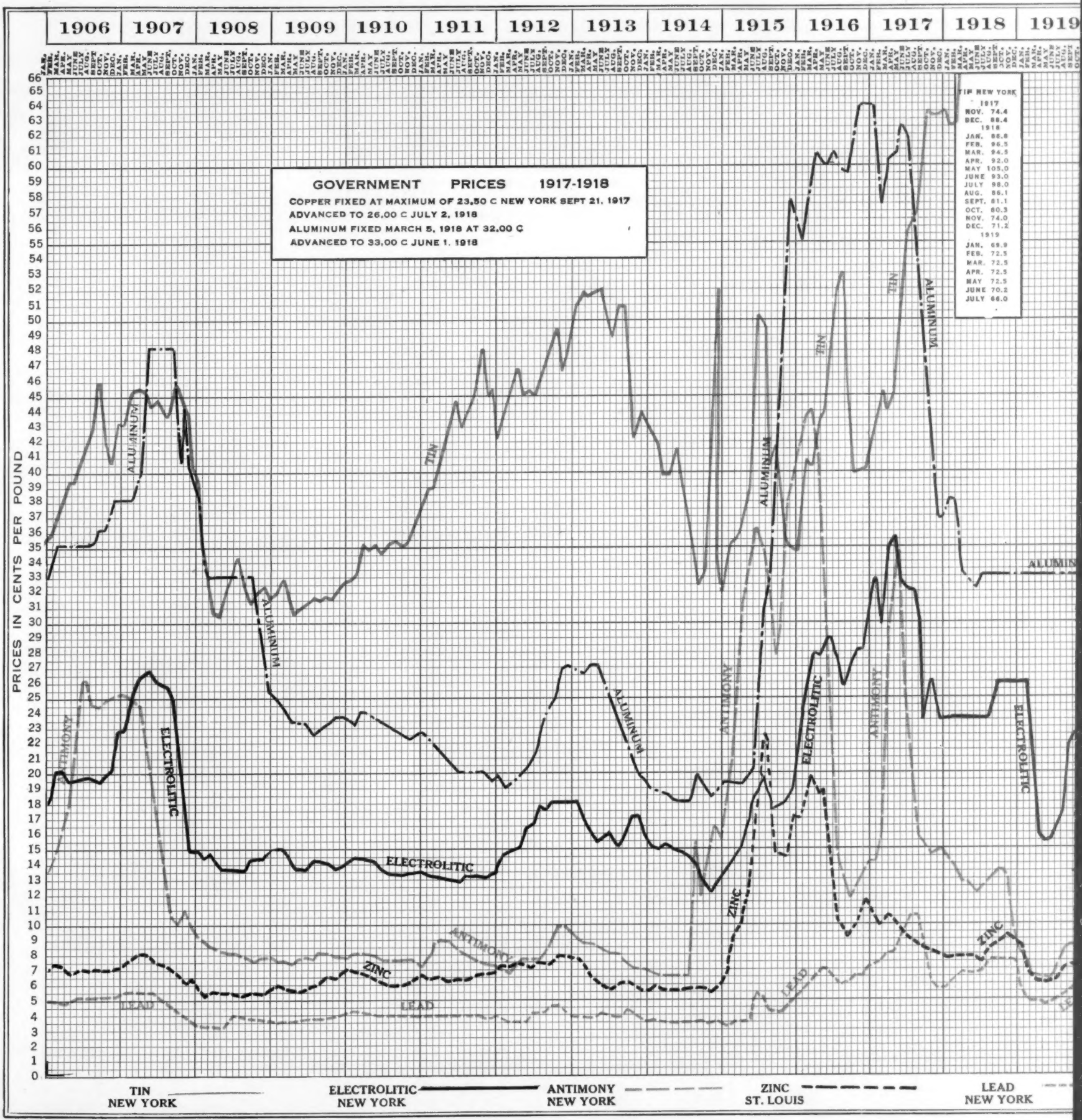
Other important measures which are pending before the international chamber and which will be discussed at the Brussels conference are the elimination of duplicate taxation, the limitation of national armament to lighten taxation.

French Business Progress in 1924

	PRODUCTION —Metric Tons 000 Omitted—					IMPORTS —Metric Tons 000 Omitted—		EXPORTS —Metric Tons 000 Omitted—		
	Iron ore	Coke	Pig iron	Steel Ingots Castings	No. Fur. in blast	Coke	Pig iron	Steel	Pig iron	Steel
Mo. av., 1913..	3,587	333	427	385	...	...	...	...	...	...
Mo. av., 1922..	1,736	85	436	378	...	428	5	56	60	173
Mo. av., 1923..	1,952	166	441	415	...	302	5	55	49	154
January, 1924..	2,257	196	586	541	127	333	8	67	52	172
February	2,163	200	590	554	134	408	3	73	92	203
March	2,272	222	634	572	136	491	2	59	72	275
April	2,145	215	651	567	136	703	3	59	76	259
May	2,286	220	658	598	135	522	4	44	47	197
June	2,188	212	638	554	135	474	4	48	53	161
July	2,415	224	637	562	137	580	5	59	44	141
August	2,426	233	655	581	133	364	3	64	51	142
September ...	2,624	224	641	602	136	418	1.6	65	63	126
October	....	...	660	609	135	...	...	...	...	...

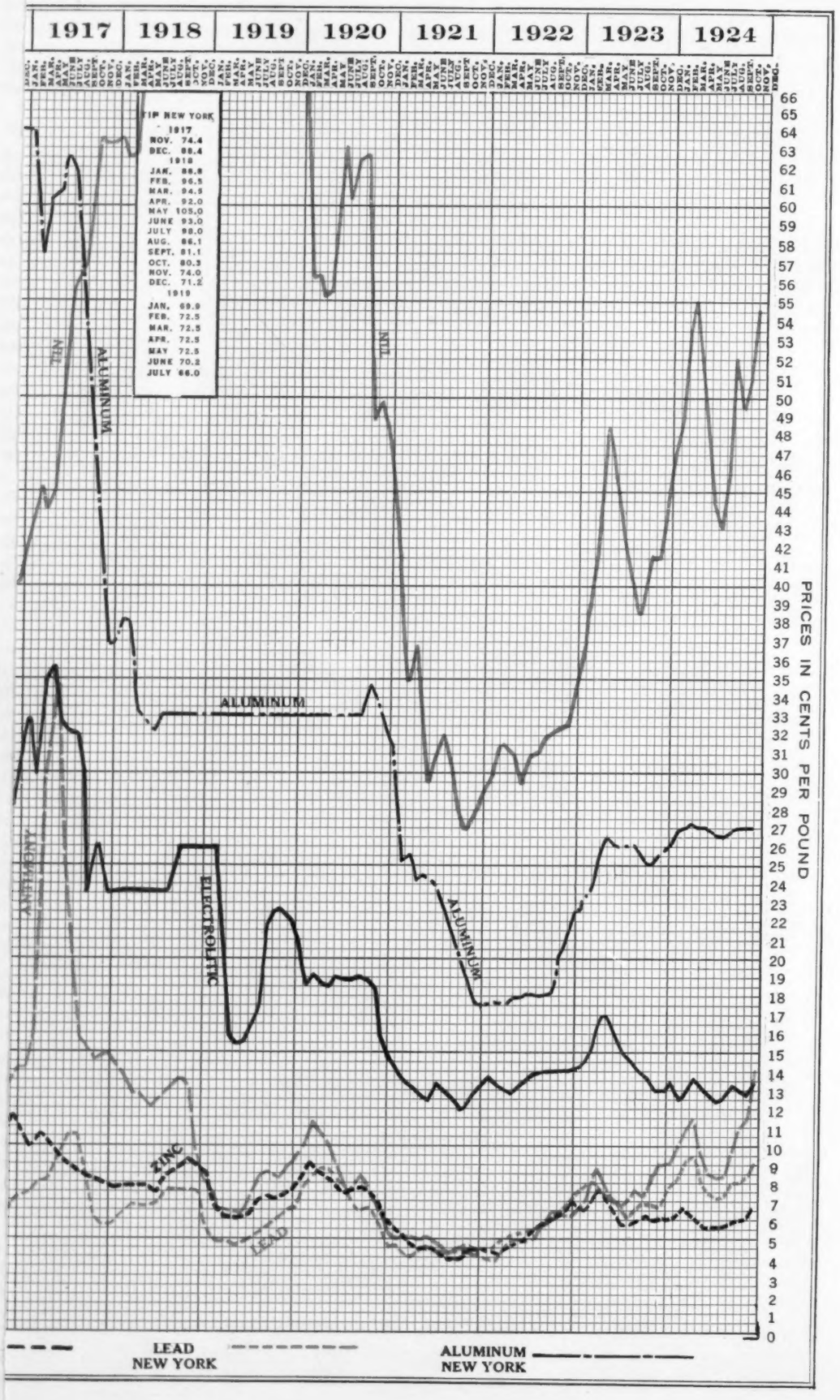
IRON TRADE REVIEW

Fluctuations in prices of pig tin, aluminum, antimony, lake copper, zinc



RADE

lake copper, zinc and lead, 1905-1924



Belgian Steel Industry Gains

Production Exceeds Prewar Years—Favorable Exchange Increases Exports and Broadens Markets—Semifinished Steel Requirements Came from Luxemburg Under Free Tariff Agreement—Labor Troubles Lessened

THE Belgian iron and steel industry made a great stride forward during 1924. Production of all classes of metallurgical products exceeded that of prewar years and surpassed even the average rate of production during 1913. During the first nine months the monthly output of pig iron average 233,180 metric tons, an increase of approximately 12 per cent over the average monthly production for 1913. The total output of steel ingots and castings up to Oct. 1 amounted to 2,142,080 metric tons as compared with 1,849,968 tons for the corresponding period of 1913. This represents an average monthly output of 238,009 tons for an increase of 20 per cent over the monthly average during 1913. The monthly average during 1923 was 188,115 tons. During the first nine months of 1924 Belgian mills produced 1,774,690 tons of finished steel products or an average of 197,188 tons per month. This is an increase of 25 per cent over the 1913 figures and exceeds the average monthly output for 1923 by 20 per cent.

Pig iron production increased steadily throughout the year. On Jan. 1, 1924, 41 blast furnaces were blowing in Belgium. Additional furnaces were blown in as the year went along and on Oct. 1 there were 48 furnaces in blast. The price of foundry pig iron at beginning of the year was 415 francs ($18.67 at the current rate of exchange) per metric ton. As the Belgian franc began to depreciate rapidly toward the end of the first quarter prices were advanced and on March 30 quotations averaged 470 francs ($16.45). From this date forward and in keeping with the appreciation in value of Belgian exchange, prices began to trend downward reaching as low as 335 francs ($15.07) per metric ton in September. At this figure considerable tonnage was exported to Great Britain and also to the United States and other foreign markets. It is to be noted, however, that under normal conditions Belgium is not an exporter of pig iron as its entire production is readily absorbed by its own foundries and steel plants.

The coke situation gradually adjusted itself and supplies were ample throughout the year. It is true that practically one-half the coke consumed by Belgium's industries was imported, but home ovens never have been able to cope with the demand. Statistics for 1913 show that out of the average of 383,480 tons of coke consumed monthly in Belgium, home ovens provided 233,860 tons and 149,620 tons monthly were received from foreign sources of supply. During the first nine months of 1924 Belgian ovens produced 3,149,140 tons of coke and imports for this period amounted to 2,509,830 tons. Practically all imported coke came from Germany, but certain quantities were also purchased in other countries when market conditions and exchange rate permitted. During 1924 conditions did not favor purchases of coke in the United States as was the case in 1923, but imports from England and Czecho-Solvakia were fairly heavy.

Belgian Production

Metric Tons

Monthly average,	Coke	Pig iron	Steel ingots and castings	Finished steel
1913 ..	.....	207,058	205,552	154,922
1921 ..	115,913	73,032	65,586	69,342
1922 ..	225,624	133,685	130,304	117,499
1923 ..	346,366	182,344	188,115	161,115
1924				
Jan.	375,800	208,980	230,970	200,900
Feb.	351,480	205,930	225,910	192,820
March .	367,360	230,490	241,050	206,470
April ...	355,400	239,530	240,740	195,670
May ..	356,810	246,520	250,520	203,700
June ...	344,420	236,730	225,090	184,190
July	354,340	247,380	244,990	202,850
Aug. ...	337,120	244,310	238,090	194,120
Sept. ...	306,410	238,750	244,720	193,970
Oct	331,600	246,240	256,380	215,090

The major portion of the semifinished steel products required by Belgian finishing mills, in excess of the tonnage supplied by home manufacturers, was imported from Luxemburg. The word imported is perhaps not the exact term to apply as no tariff barrier exists betweeen Belgium and Luxemburg. The free trade agreement which was concluded between these countries about two years ago has proven satisfactory to both parties and in all probability will be continued. Belgium and France have tried at various times to formulate a similar trading pact, but it is doubtful whether this will ever be accomplished as the economic situation of the two countries presents many points of striking contracts.

Export business was spotty during 1924 but the volume of business on the whole was satisfactory. Exchange rates influenced the market and a downward movement of the franc invariably accelerated the export demand. Shipments of bars, sheets and other building material to Japan were very heavy during the early part of the year. Belgian rails, bars and structural shapes were also sold to England. Holland and France were good customers for the Belgian plate mills. India and South America are noted among other countries as users of Belgian steel products. Pipe was exported to Spain. Belgian steel manufacturers are slowly regaining the foreign markets lost to them during the war. Now that the furnaces and steel mills which were destroyed by the war have been rebuilt along modern lines and in many instances with facilities for increased prediction the importance of export markets is greater than it ever was before.

Labor conflicts were less numerous during 1924 than in other post-war years. Wage scales were adjusted in keeping with the index figure of the cost of living. This index figure is determined by the government at frequent intervals based upon a comparison of the price of a certain number of stable commodities with the prewar price for the same articles. Fluctuations in the cost of living were narrower and less frequent during 1924 than in previous years and this greatly reduced labor problems.

According to the Belgo-Luxemberg economic union, import, and export figures for September were the highest of the year and also considerably higher than those for September, 1923. In fact, figures covering the first nine months of 1924 are pretty well on a par with those of the corresponding period of 1923.

The iron and steel production of the Grand Duchy of Luxemburg for October reached its highest mark since the beginning of the year. The output of pig iron was 189,072 metric tons compared with 177,048 tons in September and 186,793 tons in March. The production of steel during October was 168,158 metric tons against 158,243 tons in September, which was the highest mark of the year at that date. The output of pig iron included 166,107 tons of basic bessemer steel, 1133 tons of open-hearth steel and 718 tons of electric steel.

German Outlook Is Promising

Industry Receives New Start, Through Settlement on Dawes Plan—Stabilization of Mark a Favorable Development After Unsatisfactory Year—Steel Operations Now at 75 Per Cent of Capacity

BY DR. E. H. REGENSBURGER

THE situation of the German iron and steel market at the end of the year 1924 showed an improvement which contrasted with the conditions prevailing during the main part of the year.

The outstanding feature of the German economic life in 1924 was the stabilization of the mark. However, this has had a hampering effect on the iron and steel market since the Reichsbank heavily restricted all credits to the industry to prevent a new inflation. As a result, during the spring and summer the market exhibited a downward trend until the time when the London agreement was signed. The acceptance of the Dawes scheme then brought a new impetus to business. Following this event private credits to the German industry gradually increased and the Franco-Belgian missions also began their withdrawal from the Ruhr district. This, together with the facility with which the external German loan was subscribed, gave a new start to business during the last months of the year.

During the whole year business in Germany was hampered by the shortage of capital, which was a heavy handicap for producers as well as for consumers. When the Reichsbank declined to continue to discount commercial bills the rates of money increased heavily and went up to 20 per cent a year, including the high commissions of the banks. Even then money was very difficult to obtain and many industrial and commercial undertakings were compelled to go under receivership and the economic life of the country was seriously disturbed. As an instance, one of the largest European producers of special steels, the Stahlwerk Becker, had to go under receivership in May as the means necessary to set this concern on its feet could not be procured.

This state of affairs governed during the greater part of the year and it was only during the fall that a greater influx of foreign capital could be obtained. It was only in October when the new German currency was finally stabilized that the Reichsbank again resumed to some extent the discounting of commercial bills. At this time of year the iron and steel industries began to revive, due to the discontinuance of the Micum agreements and the withdrawal of the French and Belgians from the Ruhr. Furthermore, the duties between the occupied regions and the rest of Germany were canceled and the traffic on the Rhine-Herne canal was again permitted. Finally, toward the middle of November the Franco-Belgian Regie ceased to operate the Westphalian railroads and handed them back to the new German railroad company. The taxes which heavily burdened the German economic life were also alleviated, particularly with regard to the turnover tax which was reduced from 2½ per cent to 1½ per cent.

During the first months of the year the steel plants operated at about 50 per cent of capacity. They then increased their operations until at the end of the year they were working at from 70 to 75 per cent. The annual capacity of production of steel ingots and castings, or raw steel, is now estimated in Germany at 14,000,000 metric tons. For the year 1924 it is estimated that the production of raw steel in Germany would attain about 8,500,000 metric tons, which is considerably in excess of the output of 1923 which as yet is unknown. With regard to pig iron, it can be estimated that the 1924 output exceeded 8,000,000 tons, the output in 1922 was about the same. In view of these figures it should be noted that at the beginning of the year only 33 out of the 84 furnaces located in the Ruhr district were operating. The number of furnaces blowing before the occupation in the same district was 55.

German steel business was hampered all through the year by the shortage of money. At the beginning of the year the home market was disturbed by the breaking up of the German Steel association, while French, Belgian and Luxemburg competition on the German market began to increase due to the depreciation of the franc. The credit restrictions of the Reichsbank which came into force in April further disturbed the market. In many instances the prices of German works were undercut by merchants who liquidated their stocks at a sacrifice to obtain money.

In May a number of works were at a standstill in the Ruhr district, due to a coal strike which lasted several weeks and caused a loss of more than 7,000,000 tons of coal. The Upper Silesian producers profited by this strike and succeeded in booking orders which otherwise would have been placed with the Ruhr works. However, this improvement was a small compensation in view of the bad conditions under which the Upper Silesian industries were working during the year. These conditions were due to the competition of the western steel industries and to high freight rates. At the end of the year only six of the 15 Upper Silesian furnaces were blowing.

In November the outstanding feature was the establishment of the German Raw Steel union which includes 95 per cent of all German steel producers. The total capacity of the combined plants aggregates about 14,000,000 metric tons. However, the first step of the union was to cut the output of finished products by 20 per cent of that of semifinished products by 10 per cent for December. As a result, consumers anticipated a rise in prices and this caused them to increase their purchases. Unfilled orders at the works at the end of the year covered a period of from eight to ten weeks, but it should be noted that this only corresponds to the reduced rate of production. The optimistic outlook is somewhat damped by a menace of labor troubles, since demands for higher wages are coming in view, due to the increased cost of living.

The German iron and steel export figures for 1924 were even smaller than for the preceeding year and only reached about 50 per cent of the 1922 figures. Apart from the general causes already mentioned, the shortage of capital played a prominent part as it made it impossible for producers and merchants to grant credits to foreign consumers. The heavy competition on the part of Belgian and French works, resulting in the depreciation of the franc, was also a considerable factor. During the first nine months of 1924 exports were 14 per cent lower than during the corresponding period of 1923.

The decrease was noted on almost all products excepting certain classes of sheets and wire products; the exports of medium-gage sheets during the period under consideration increased from 27,511 metric tons to 33,623 metric tons. mainly resulting from increased shipments to British India; light-gage sheets advanced from 8477 tons to 18,394 tons,

due to increased shipments to Holland; galvanized sheets advanced from 5804 tons to 9054 tons, resulting from increased shipments to Switzerland; galvanized wire advanced from 34,849 tons to 56,132 tons, due to increased shipments to the Far East; barbed wire advanced from 20,568 tons to 22,888 tons, resulting from better sales to Brazil.

The Far East, particularly Japan, constituted one of the best outlets for German goods. About 60 per cent of the bars exported were shipped direct to Japan; about 24 per cent of the plates exported went to Denmark; 29 per cent of the medium-sized sheets were shipped to British India and light-gage sheets went especially to Switzerland and Holland. The destinations of wire products were especially Japan and South America. The exports of railroad material during the year were poor, but scrap exports increased from 138,388 metric tons during the first nine months of 1923 to 251,754 tons during the corresponding period of 1924. Of this tonnage 34 per cent went to Polish Upper Silesia, 27 per cent to Czechoslovakia and 20 per cent to England. Imports of semi finished products decreased from 238,660 tons to 85,036 tons, due more especially to smaller purchases from Polish Upper Silesia where the output was heavily reduced owing to labor troubles and also because prices were generally above those prevailing in Germany. For the same reasons imports of bars and structural shapes dropped from 450,977 tons to 301,550 tons. Plates were about the only class of products which was marked by an increase in imports.

During the whole year the pig iron market was dull and several producers had to close down owing to insufficient sales. Exports of pig iron were only 34,910 metric tons during the first three quarters of 1924 against 66,143 in the corresponding period of 1923. Imports were respectively 161,940 tons and 249,532 tons. Most of the tonnage imported came from Lorraine and England, while exports went principally to Polish Upper Silesia.

In view of the comparatively brighter situation at the end of the year, the outlook for 1925 is more promising. However, a great deal depends on the way in which the Dawes scheme will work out in practice. There are hopes that the conclusion of the commercial treaties which are now being negotiated between Germany and other countries will ease the situation. This is particularly true with respect to the various taxes and particularly the 26 per cent export duty which is levied under the Reparations Recovery Act in England. In the domestic market the sentiment is more optimistic and it is expected that with an improvement in the general economic situation of Germany the iron and steel industries will recover. It is anticipated that building activities will increase in the course of 1925 and a considerable tonnage of orders on reparations account are also expected to keep the works operating to a fair percentage. The new German Raw Steel union is also expected to have a stabilizing influence on prices.

German Iron and Steel Exports

Commodity	1924	1923 (January to September)	1922 (January to September)
Scrap	272,566	380,887	98,467
Bars and structural shapes	126,413	197,432	512,313
Wire nails	55,108	60,009	67,448
Wire (including wire rods and galvanized wire)	96,291	122,554	173,512
Plates	65,003	95,640	117,607
Milk cans, steel bottles, etc.	47,716	54,282	82,300
Pipes, rolled or plain	39,701	52,866	135,828
Pig iron	34,910	66,143	110,411
Medium sheets	32,623	27,511	33,996
Kitchen utensils, lamps, etc.	24,891	27,128	27,550
Barbed wire	22,888	20,568	27,197
Agricultural implements	24,490	25,940	37,234
Stove castings	21,299	28,401	30,079
Pipes, nonforgeable	20,453	36,490	49,233
Tools and implements	20,077	30,243	43,047
House hardware	19,639	30,634	39,362
Thin sheets	18,934	8,477	22,254
Total, including items not specified above	1,147,053	1,331,120	1,889,116

1923 and 1924 figures contain only part of the exports from the occupied area.

The import and export figures of iron ore during 1924 indicate that foreign trade in this commodity was only about one-half the tonnage of 1923. The excess of imports decreased from 1,850,369 metric tons during the first nine months of 1923 to 1,003,347 tons in the corresponding period of 1924. In January, 1924, the imports of ore were only 67,250 metric tons. They then increased up to June when the maximum was reached with 237,116 tons and afterward dropped to 129,460 tons in July, advancing again to 218,495 tons in September. Of these imports 44 per cent originated from Sweden and at the end of the year this percentage increased to 88 per cent; at that period the Swedish Graengesberg company exported tonnages to Germany which almost equaled their normal prewar shipments. It is reported that in July a contract was signed with the British Steel corporation for the regular delivery of about 100,000 to 125,000 tons of Wabana ores.

The coal situation during 1924 was unsatisfactory. A tax totaling about $15,000,000 had to be paid to the Micum. A tax of eight francs (about 50c) per ton also had to be paid for each ton sold, but toward the end of the year this tax was reduced to 0.25 rentenmarks (6c). Furthermore, about 20 per cent of the output of the coal mines had to be delivered to the Micum on reparations account. It is estimated that during the spring these various taxes and obligations burdened the price of steel by about 25 rentenmarks ($6) per ton. In view of the bad market conditions coal prices had to be cut. Moreover, the output was reduced by 25 per cent in August and by 55 per cent in November. The extraction of coal from the German pits for the first ten months of 1924 totaled 84,963,642 metric tons or an average of about 850,000 tons a month compared with the monthly average of about 520,000 tons in 1923. On the German market the minimum prices were reached about August. September brought an improvement, due to the acceptance of the Dawes report and the abolition of the French and Belgian coal tax and tariffs. There was also a cut of 10 per cent in railroad rates, a reduction of the turnover tax from 2½ to 1½ per cent and a cut of 10 per cent in coal prices. However, in view of keen competition from other producing nations this improvement in prices subsided in October and it is only since then that quotations gradually rose until the end of the year. It was only in November, when the price of merchant bars reached 120 rentenmarks per ton ($28.60), that producers could figure on a small profit. It is claimed that until then they were working at a loss.

As a whole the year brought distinct gains to the German steel industry and a number of limiting factors were removed, giving opportunity for operation in many respects more like a normal condition. At least there were fewer uncertainties and manufacturers were able to proceed with more assurance and to lay their plans on a better basis than for some time. Much remains to be corrected but sufficient headway has been made to assure a final condition that will restore the industry to something like its former strength and position.

New Era Opening in Iron Ore Industry

(*Concluded from Page* 39)

Louise, formerly the Mille Lacs mine.

At the Shada mine of Clement K. Quinn & Co. on the Mesabi range, the present stripping program has been completed, this property having been changed to a good size open pit, from a comparatively small underground mine. The stripping now done leaves available a five-year supply of ore before it will be necessary to do any further stripping.

On the Cuyuna range changes have been brought about which affect favorably the operation of the Mahnomen open pit. During the year negotiations were brought to a successful conclusion, and as a result Bethlehem Steel Corp. and Pickands, Mather & Co. have become interested with Quinn & Co. in this mine, and both of the companies will take all of their manganiferous ore requirements in the future from the Mahnomen. The operation of the mine, however, remains in the hands of Quinn & Co.

On the Marquette range in Michigan certain changes have been made in the operations at the Rolling Mill mine. A crushing plant has been installed and was in operation during the entire 1924 season on a silicious grade of ore which is produced from an open pit on the Rolling Mill property.

Immediately following the close of navigation in 1924 steps were taken to make this crushing plant available for use in connection with the several grades of ore that are produced from underground in the Rolling Mill mine; and beginning with the first shipments in 1925 all grades produced from this mine will be crushed to a maximum of 3 inches.

Between the close of navigation in 1924 and Dec. 1, the shaft was deepened and is now bottomed at 1000 feet.

Drilling on Marquette Range

An item of interest on the Marquette range is the drilling campaign now being undertaken by R. S. Archibald on a large tract of favorable ground west of Ishpeming and lying between the Barnes-Hecker and Morris mines of the Cleveland-Cliffs Iron Co. The property is well located, being adjoined by the American mine on the west boundary.

The Sagamore mine of John A. Savage & Co., Cuyuna range shipped approximately 250,000 tons of crushed and dried manganiferous ore in 1924. Demand for this grade of ore increased. Stripping now is well underway at the mine, and during the winter additional crushing machinery will be installed. The electric shovel equipment is notable, comprising a 400-ton Marion-type for loading ore, with a Marion-type caterpillar electric for track grading and auxiliary ore loading These two shovels are operated with direct current The stripping is done by a large electric dragline, using alternating current. No steam shovel equipment is used at the mine. The company's Croft mine, which is the only bessemer ore producer on the Cuyuna, was idle during 1924, but is expected to resume production soon.

The Soo line has begun the use of larger locomotives in hauling ore from the Cuyuna range to the docks at Superior, Wis. They are of the mikado type and capable of hauling 130 to 140 ore cars in a train.

Foreign Iron Ore Is Competing in East

THE close of 1924 finds the eastern iron ore outlook better than in a long time. The furnaces in January had good stocks on hand, with much additional tonnage due on contracts. Continuous contraction of pig iron output prevented consumption of the stocks and there was no important buying during the year. The year closes with the furnace stocks fairly large. The great change in the pig iron situation in November and December is encouraging increased pig iron production. It is on this outlook for increased production of pig iron, together with the fact that there has been very little ore contracting, that iron ore producers pin their faith.

Early in 1924 eastern ore of foundry and basic quality was in some cases bringing higher than 10 cents per unit delivered at eastern furnaces. The range soon established itself at 9 to 10 cents and this level continued until close to the end of the year. At present the range in the East is 9¼ to 9½ cents per unit delivered, with an upward tendency. If expectations for a 50-cent advance in Lake Superior ore materialize, the eastern market is expected to develop a price of 10 cents or slightly higher.

In the order of their importance, the chief sources of the ore that was delivered to eastern furnaces during 1924 were New York state, foreign countries, New Jersey and the lake region. The foreign sources included Sweden, Spain and Africa. No allowance is made here for the large tonnages which the Bethlehem Steel Co., as usual, brought in for its own use, from its own mines in Chile. This ore was not a factor in the market. It was the foreign ore that set the competition for easern business in 1924, and the prices on foreign ore continue to influence the general market.

Freight Cost Is Higher

Some blast furnace interests say one reason why lake ore is selling in smaller tonnages in the East is because this ore is leaner than formerly, making a higher unit charge for the freight.

During 1924 the eastern furnaces used larger quantities of borings and turnings and other scrap material in their burdens than usual. The use of scrap, however, has been checked by the recent sharp advances in scrap prices.

Another change from practice of former years is the decreasing use of pyrites cinder in place of iron ore. At one time large tonnages of cinder were employed, due to the wide use of ore in producing sulphur and sulphuric acid. The great shrinkage in this industry has reduced the supply of pyrites cinder to negligible proportions.

Imports of iron ore in the first ten months of 1924 totaled 1,641,646 tons, compared with 2,533,586 tons in the corresponding period of 1923. The tonnage shipped in from Chile last year amounted to 890,975 tons, while in the first ten months of 1923 no ore was imported from that source. The following table presents a record of the imports for the first ten months of the two years:

	Gross tons	
From:	1924	1923
Spain	56,736	214,890
Sweden	261,355	704,867
Canada	3,413	24,525
Cuba	242,213	647,379
Chile	890,975	.....
French Africa	150,682	.....
Other countries	36,472	941,925
Totals	1,641,646	2,533,586

Despite the reduction of 80 cents in the price of Lake Superior iron ore in 1924, comparatively little ore was shipped into the eastern territory, because of light demand. Otherwise the competitive price situation was more favorable to the lake ore producers than it has been in several years.

Steel Expansion Trend Is Westward

(*Concluded from Page 63*)

include the No. 4 stack of the Shenango Furnace Co., Sharpsville, Pa., and built in 1872; the Union stack of the Union Furnace Co., Ironton, O., built in 1874; and Cambria "C" of the Bethlehem Steel Corp., Johnstown, Pa., built in 1874.

Various types of rolling mills completed during 1924, as listed in Table X, total 67. During the preceding year mills devoted to the reduction of iron and steel aggregated 171 compared with 46 in 1922 and 185 in 1921. During 1920 the number of completed rolling units reached 241 compared with 50 in 1919. Each year since IRON TRADE REVIEW began to compile a list of new rolling mills built in the United States, the various lists have included sheet mills and the report for the year just closed has been no exception. Tables I and X show that 14 hot mills were added or 21 per cent of the year's complement of various types. During 1923 the installation of 49 hot sheet mills was recorded while the list for 1922 shows 18. Those devoted to hot rolling of sheets built in 1921 reached 59. New hot sheet mills scheduled for their initial run in 1920 totaled 82 compared with 22 in 1919. During the last six years, therefore, 244 hot mills devoted to the rolling of steel sheets have been installed or about 33 per cent of the various type rolling units built during this period. This year 10 hot sheet mills are scheduled for completion and this number likely will be augmented as a result of the abolition of the "Pittsburgh plus" arrangement of basing prices.

The Mahoning Valley further intrenched itself in holding its rank of the largest sheet producing district in the world. Eight more hot sheet mills were added by the Youngstown Sheet & Tube Co. bringing its total to 31 and increasing the number of district mills adapted to sheetmaking to 127. The eight new hot mills are devoted to the production of automobile sheets which together with those operated by the Newton Steel Co. brings the total number of high-grade sheet mills in the Mahoning Valley to 28.

Strip steel rolling facilities included in the list of rolling mills completed last year again commands attention. One new company entered the industry installing three units for cold rolling. Four established companies increased their cold rolling capacity by the addition of 23 mills. As a result 26 new cold strip mills were placed under power, 12 each being located in Pennsylvania and Ohio and two in Michigan. This compared with 38 in 1923, 14 in 1922, and 41 in 1921 and brings the total number of cold strip mills installed in this country during the past four years to 119. Four merchant mills also were installed last year, one being devoted to the rolling of propeller blades. A similar number of merchant mills was installed in 1923 compared with one the year previous, eight in 1921, 12 in 1920 and one in 1919 making a total of 30 in the last six years.

Rolling mills under construction at the close of 1924 totaled 81. Manufacturers of structural material evidently are anticipating a large demand for various shapes as is indicated by the four new structural mills under construction. Other installations of an important character in the process of construction include six blooming, six pipe, eight merchant and 10 hot sheet mills. The erection of the four sheet mills in Alabama marks a new direction of expansion of the sheet industry. The present southern limits of sheet rolling are in Ashland, Ky., and St. Louis.

Table XII

New Electric Furnaces Operated in 1924

	No. of units	Size tons
BOOTH		
Continental Axle Co., Edgerton, Wis.	1	1½
General Boilers Co., Waukegan, Ill.	1	¾
SWINDELL		
Allegheny Steel Co., Brackenridge, Pa.	1	¾
General Electric Co., Schenectady, N. Y.	1	1
General Electric Co., Schenectady, N. Y.	1	3
Kelly & Jones Co., Pittsburgh	1	1½
Locomotive Finished Materials Co., Atchison, Kans.	1	1½
Ohio Steel Foundry, Lima, O.	1	½
Sullivan Machinery Co., Chicago	1	1½
MOORE		
Nevada Consolidated Copper Co., McGill, Nev.	1	1½
Ross-Meehan Foundries, Chattanooga, Tenn.	1	3
HEROULT		
Colonial Steel Co.	1	3
Lorain Steel Co., Johnstown, Pa.	1	3
UNCLASSIFIED		
Firth-Sterling Steel Co., McKeesport, Pa.	1	3

Machine Tools Refined in 1924 Progress

(*Concluded from Page 34*)

shoved into place. The machine operator is freed from all lifting.

Numerous chucks of both magnetic and pneumatic types have been placed on machines to facilitate loading and unloading work. These chucks largely are responsible for minimizing idle time of the units.

Tool builders have effected savings in production costs by using, in the case of one machine manufactured in several sizes, the same sized parts as far as possible. This results in excess strength on the lighter models, but it is cheaper to provide the extra strength than it is to prepare designs and manufacture a new set of parts. Assembly costs on all the machines also are reduced through the use of standard parts.

Constructive Leadership at Washington

(*Concluded from Page 76*)

elimination of waste in industry have touched many fields and in the past year have extended from reductions of sizes in steel sheets and lumber to caps for milk bottles. An important achievement was the complete standardization of the lumber industry and the provision of rules for the grading of all lumber.

Reduction of a large number of weights, sizes, gages and grades in iron and steel products was accomplished during the year in sheet steel, woven wire fencing, metal lath, range boilers, files and rasps, forged tools, bolts and nuts for farm equipment, hot water storage tanks, steel lockers, steel barrels and drums, reinforcing bars, terne plate, builders' hardware and many other products. A number of simplification projects are under way at present, many of which will be acted upon this year. A considerable number affect the iron and steel industry.

Under a recent law the census of manufacture is taken every two years, and to facilitate the work and at the same time reduce the cost to the government, the census bureau has obtained the co-operation of industrial corporations, chambers of commerce in every important city, boards of trade and other organizations. The officials of many of these industrial organizations are serving without compensation. Cities are coming more to realize the importance of statistics showing the number of industries and the industrial advancement.

Congress again has been urged to enact a law establishing metric units of weights and measures in merchandising throughout the United States, following a transition period of 10 years. Represenutative Fred A. Britten, of Illinois, is the metric leader in the house. He regards the metric system of weights and measures by the United States as of great importance. He holds that its universal adoption will come.

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	Output— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,888	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,196,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,780	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,547,012	118,233
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	254	3,117,526	103,917
October	418	245	3,142,642	101,375
November	418	229	2,891,191	96,373
December	418	231	2,912,527	93,952
Total			40,025,850	
1924				
January	414	248	3,015,480	97,273
February	414	263	3,072,169	105,937
March	410	269	3,465,389	111,787
April	410	234	3,226,107	107,537
May	411	187	2,619,986	84,515
June	411	158	2,022,836	67,427
July	411	145	1,783,457	57,531
Aug.	411	150	1,882,986	60,741
Sept.	411	174	2,053,617	68,454
Oct.	411	182	2,461,727	79,410
Nov.	411	204	2,514,979	83,832

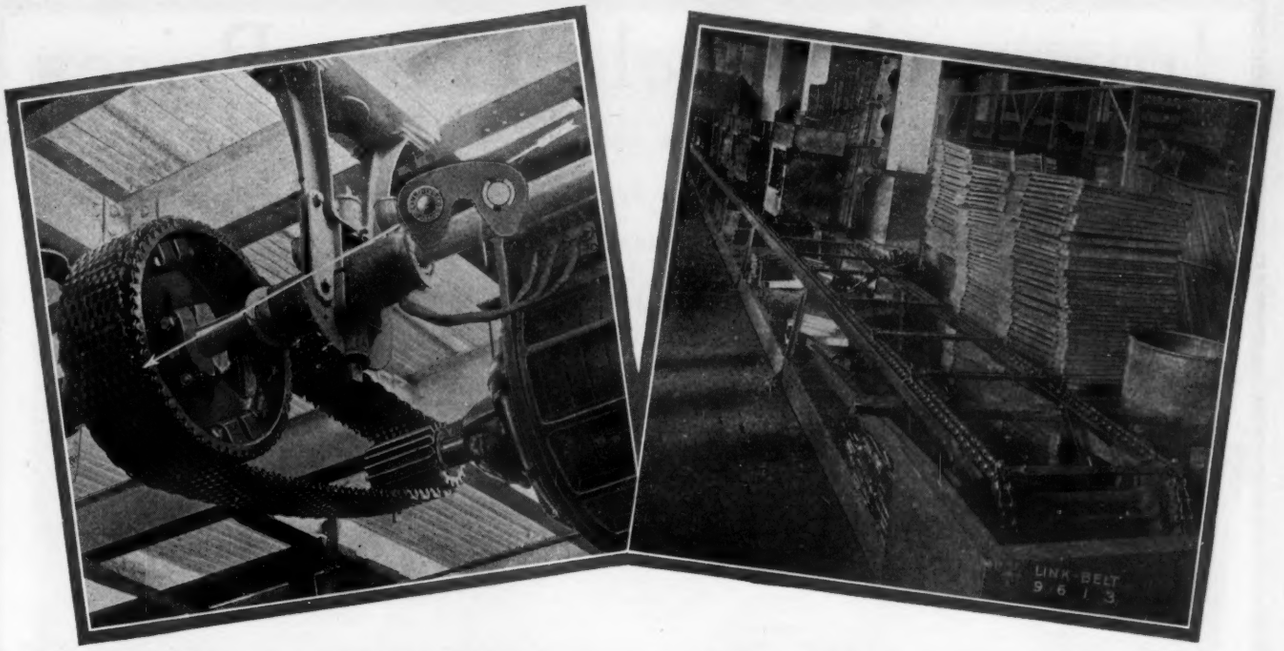
Ingots and Castings

By American Iron and Steel Institute

	Ingots	Castings	Total
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797
1922	34,568,418	1,034,508	35,602,926
1923	43,485,665	1,458,031	44,943,696

Monthly Ingot Output

1923	Gross Tons 94.84 per cent of capacity	Calculated total
January	3,644,629	3,841,095
February	3,294,264	3,471,843
March	3,858,675	4,066,680
April	3,760,997	3,963,736
May	4,000,695	4,216,355
June	3,574,567	3,767,256
July	3,350,829	3,531,458
August	3,506,755	3,695,788
September	3,185,082	3,356,776
October	3,394,128	3,577,091
November	2,974,005	3,134,321
December	2,716,814	2,863,266
Total	41,261,440	43,485,665
1924	94.84 per cent	
January	3,446,143	3,633,639
February	3,612,631	3,809,185
March	3,971,844	4,187,942
April	3,161,525	3,333,535
May	2,492,643	2,628,261
June	1,950,352	2,056,466
July	1,772,954	1,869,416
August	2,410,360	2,541,501
September	2,669,742	2,814,996
October	2,950,901	3,111,452
November	2,946,893	3,107,226



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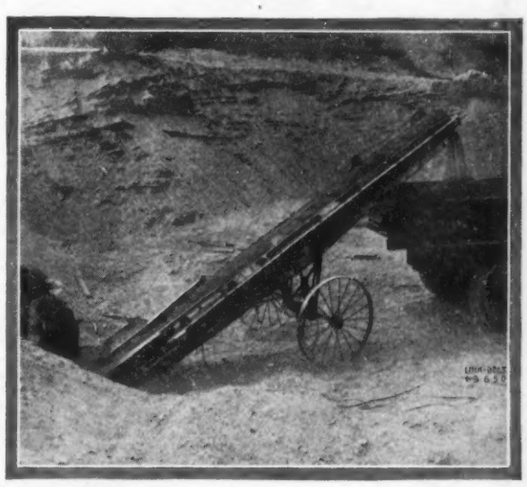

THIS YEAR LINK-BELT IS FIFTY YEARS OLD

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Leading Manufacturers of Elevating, Conveying and Power Transmission Machinery

PHILADELPHIA, 2045 Hunting Park Ave. CHICAGO, 300 W. Pershing Road. INDIANAPOLIS, P. O. Box 346. Offices in Principal Cities.

LINK-BELT

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	15.00 to 16.00
Boston (dealers)	15.00 to 15.50
Buffalo	20.00 to 21.00
Chicago	19.50 to 20.00
Cleveland	19.00 to 19.50
Cincinnati (dealers)	16.00 to 16.50
Detroit (dealers)	15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	15.00 to 16.00
Pittsburgh	21.50 to 22.00
St. Louis	17.00 to 17.50
Valleys	21.00 to 21.50
No. 1 railroad steel New York (dealers)	15.00 to 16.00

COMPRESSED SHEETS

Buffalo	18.00 to 18.50
Chicago	16.00 to 16.50
Cleveland	16.00 to 16.25
Detroit (dealers)	12.50 to 13.00
Pittsburgh	20.50 to 21.00
Valleys	18.00 to 18.50

BUNDLED SHEETS

Buffalo	15.50 to 16.00
Cincinnati (dealers)	12.50 to 13.00
Cleveland	14.50 to 15.25
Detroit	10.50 to 11.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh	19.50 to 20.00
St. Louis	12.00 to 12.50
Valleys	16.00 to 16.50

SHEET CLIPPINGS, LOOSE

Chicago	12.75 to 13.00
Detroit	9.50 to 10.00

STEEL RAILS, SHORT

Birmingham	15.00 to 15.50
Detroit, No. 2	14.50 to 15.00
Chicago	21.50 to 22.00
Cincinnati (dealers)	17.00 to 17.50
Cleveland (over 6 ft.)	17.50 to 17.75
St. Louis	19.00 to 19.50

STOVE PLATE

Birmingham	15.00 to 16.00
Boston (consumers)	15.50 to 16.00
Buffalo	15.50 to 16.00
Chicago	19.00 to 19.50
Cincinnati (dealers)	12.50 to 13.00
Cleveland	15.50 to 16.00
Detroit (net tons) dealers	13.50 to 14.00
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	13.00 to 13.50
Pittsburgh	17.00 to 17.50
St. Louis	16.50 to 17.00

LOW PHOSPHORUS

Buffalo	23.00 to 23.50
Cincinnati((dealers)	18.00 to 18.50
Eastern Pennsylvania	23.00 to 24.00
Pitts. billet and bloom crops	26.50 to 27.50

SHOVELING STEEL

Chicago	19.25 to 19.75
Pittsburgh	15.00 to 15.50
St. Louis	16.50 to 17.00

KNUCKLES, COUPLERS, SPRINGS

Chicago	23.00 to 23.50
Eastern Pennsylvania	20.50 to 21.00
Pittsburgh	23.00 to 23.50
St. Louis	20.50 to 21.00

FROGS, SWITCHES, GUARDS

Chicago	19.75 to 20.25
Eastern Pennsylvania	19.00 to 20.00
St. Louis	18.00 to 18.50

BOILER PLATE, CUT

St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Buffalo	20.50 to 21.00
Chicgo	20.50 to 21.00
St. Louis	18.00 to 18.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	14.00 to 15.00
Boston (dealers)	16.00 to 17.00
Buffalo No. 1	17.00 to 17.50
Buffalo No. 2	20.00 to 20.50
Cleveland, No. 1	16.25 to 16.50
Chicago, No. 1	19.25 to 19.75
Chicago, No. 2	19.50 to 20.00
Cincinnati, No. 1 (dealers)	14.00 to 14.50
Detroit, No. 2	15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00
New York, No. 1 (dealers)	16.50 to 17.00
Pitstburgh, No. 1	18.00 to 18.50
Pittsburgh, No. 2	21.50 to 22.00
St. Louis, No .1	17.00 to 17.50
St. Louis, No. 2	17.00 to 17.50

WROUGHT PIPE

Boston (dealers)	13.00 to 13.50
Buffalo	14.00 to 14.50
Eastern Pennsylvania	18.00 to 18.50
New York (dealers)	13.75 to 14.25

YARD WROUGHT

Boston	15.00 to 16.00
Eastern Pennsylvania	18.00 to 19.00

CITY WROUGHT

New York, long	15.50 to 16.00

BUSHELING

Buffalo	17.50 to 18.00
Chicago, No. 1	17.25 to 17.75
Chicago, No. 2	13.25 to 13.75
Cincinnati, No. 1 (dealers)	12.50 to 13.00
Cleveland, No. 1	16.00 to 16.25
Cleveland, No. 2	14.25 to 14.75
Detroit, No. 1	12.00 to 12.50
Detroit, No. 2 (new)	11.00 to 11.50
Detroit, No. 2 (old)	10.50 to 11.00
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh, No. 1	17.50 to 18.00
St. Louis, No. 1	16.00 to 16.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (dealers)	12.00 to 12.50
Buffalo	14.00 to 14.50
Chicago	12.75 to 13.25
Cincinnati (dealers)	12.50 to 13.00
Cleveland	16.00 to 16.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	12.75 to 13.25
Pittsburgh	18.00 to 18.50
St. Louis	10.50 to 11.00
Valleys	15.50 to 15.75

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	8.00 to 9.00
Boston (chemical)	16.00 to 16.50
Boston (dealers)	11.50 to 12.00
Buffalo	14.50 to 15.00
Chicago	14.75 to 15.25
Cincinnati (dealers)	12.50 to 13.00
Cleveland	16.25 to 16.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania (chem.)	20.00 to 21.00
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	10.75 to 11.25
Pittsburgh	16.50 to 17.00
St. Louis	12.00 to 12.50
Valleys	16.50 to 17.00

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	9.50 to 10.00
Cleveland	16.00 to 16.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	13.00 to 15.00
New York (dealers)	10.25 to 10.75
Pittsburgh	15.00 to 15.50

IRON AXLES

Birmingham	19.00 to 20.00
Boston (consumers)	31.00 to 32.00
Buffalo	26.50 to 27.00
Chicago	31.25 to 31.75
Cincinnati (dealers)	23.50 to 24.00
Eastern Pennsylvania	30.00
St. Louis	27.50 to 28.00

IRON RAILS

Buffalo	18.00 to 18.50
Chicago	19.00 to 19.50
Cincinnati (dealers)	14.00 to 14.50
St. Louis	18.00 to 18.50

PIPES AND FLUES

Chicago	15.25 to 15.75
Cincinnati (dealers)	10.50 to 11.00
Cleveland	14.50 to 15.00
St. Louis	13.50 to 14.00

RAILROAD GRATE BARS

Buffalo	15.50 to 16.00
Chicago	18.00 to 18.50
Cleveland	15.50 to 16.00
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	14.00 to 14.50
St. Louis	16.75 to 17.25

FORGE FLASHINGS

Boston (dealers)	12.00 to 12.50
Buffalo	15.00 to 15.50
Chicago	14.00 to 14.50
Cleveland (under 10 in.)	15.50 to 15.75
Cleveland (over 10 in.)	14.75 to 15.00
Detroit (dealers)	11.50 to 12.00
Pittsburgh	17.00 to 17.50

FORGE SCRAP

Boston (dealers)	12.00 to 12.50
Chicago	23.50 to 24.00
Eastern Pennsylvania	17.50 to 18.50

ARCH BARS AND TRANSOMS

Chicago	24.75 to 25.25
St. Louis	21.50 to 22.00

ANGLE BARS—IRON

Chicago	21.50 to 22.00
St. Louis	22.50 to 23.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	12.50 to 13.00
Buffalo	15.00 to 15.50
Chicago	17.00 to 17.50
Cleveland	16.50 to 16.75
Eastern Pennsylvania	18.00 to 18.50
Pittsburgh	18.50 to 19.00
St. Louis	13.00 to 13.50

STEEL CAR AXLES

Birmingham	18.00 to 19.00
Boston (consumers)	20.50 to 21.00
Buffalo	20.00 to 20.50
Chicago	23.50 to 24.00
Cleveland	19.50 to 20.00
Eastern Pennsylvania	25.00 to 26.00
Pittsburgh	22.50 to 23.00
St. Louis	22.25 to 22.75

SHAFTING

Boston (consumers)	21.00 to 21.50
Chicago	23.50 to 24.00
Eastern Pennsylvania	25.00 to 26.00
New York (dealers)	18.50 to 19.50
St. Louis	20.00 to 20.50

Iron Foundry Scrap

CAR WHEELS

riBmingham, tram car	17.00 to 18.00
Birmingham, iron	16.00 to 17.00
Boston (consumers)	18.00 to 19.00
Buffalo	20.00 to 20.50
Chicago, iron	20.50 to 21.00
Chicago, steel	22.50 to 23.00
Cincinnati	14.00 to 14.50
Eastern Pennsylvania	19.00 to 20.00
New York iron (dealers)	15.00 to 15.50
Pittsburgh, iron	20.50 to 21.00
Pittsburgh, steel	23.00 to 23.50
St. Louis, iron	19.50 to 20.00
St. Louis steel	20.50 to 21.00

NO. 1 CAST SCRAP

Birmingham, cupola	17.00 to 17.50
Boston (consumers)	19.50 to 20.00
Buffalo	18.25 to 18.75
Chicago, No. 1 machinery	22.00 to 22.50
Chicago No. 1 railroad or agricultural	20.50 to 21.00
Cincinnati No. 1 machinery cupola (net tons dealers)	20.00 to 20.50
Cleveland, cupola	20.00 to 20.50
Detroit (net tons) (dealers)	15.50 to 16.00
Eastern Pennsylvania, cupola	20.00 to 21.00
New York, cupola (dealers)	17.00 to 17.50
Pittsburgh, cupola	19.00 to 19.50
San Francisco, delivered	24.00
Seattle	18.00
St. Louis, railroad	20.00 to 20.50
St. Louis, agricultural	20.00 to 20.50
Valleys	19.50 to 19.75

HEAVY CAST

Boston (consumers)	17.00 to 17.50
Buffalo (breakable)	16.00 to 16.50
Cleveland	14.50 to 14.75
Detroit (automobile) (net ton)	15.50 to 16.00
Eastern Pennsylvania	18.50 to 19.00
New York (dealers)	16.00 to 16.50
Pittsburgh	18.50 to 19.00

MALLEABLE

Boston (railroad)	17.25 to 17.75
Buffalo	20.00 to 21.00
Chicago, railroad	20.75 to 21.25
Chicago, agricultural	18.50 to 19.00
Cincinnati, agricultural (dealers)	17.00 to 17.50
Cincinnati, railroad (dealers)	17.50 to 18.00
Cleveland, agricultural	19.00 to 19.25
Cleveland, railroad	19.75 to 20.00
Detroit (dealers)	16.00 to 16.50
Eastern Pennsylvania, railroad	16.50 to 17.00
Pittsburgh, railroad	21.50 to 22.00
St. Louis, agricultural	17.50 to 18.00
St. Louis, railroad	17.75 to 18.25

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham tram car	15.50 to 16.50
Boston (dealers)	15.00 to 15.50
Chicago	20.75 to 21.25
Cleveland	19.00 to 19.50
Detroit	14.50 to 15.00
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	15.50 to 16.00
Pittsburgh district	22.50 to 23.00
St. Louis	19.00 to 19.50

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Chicago	20.50 to 21.00
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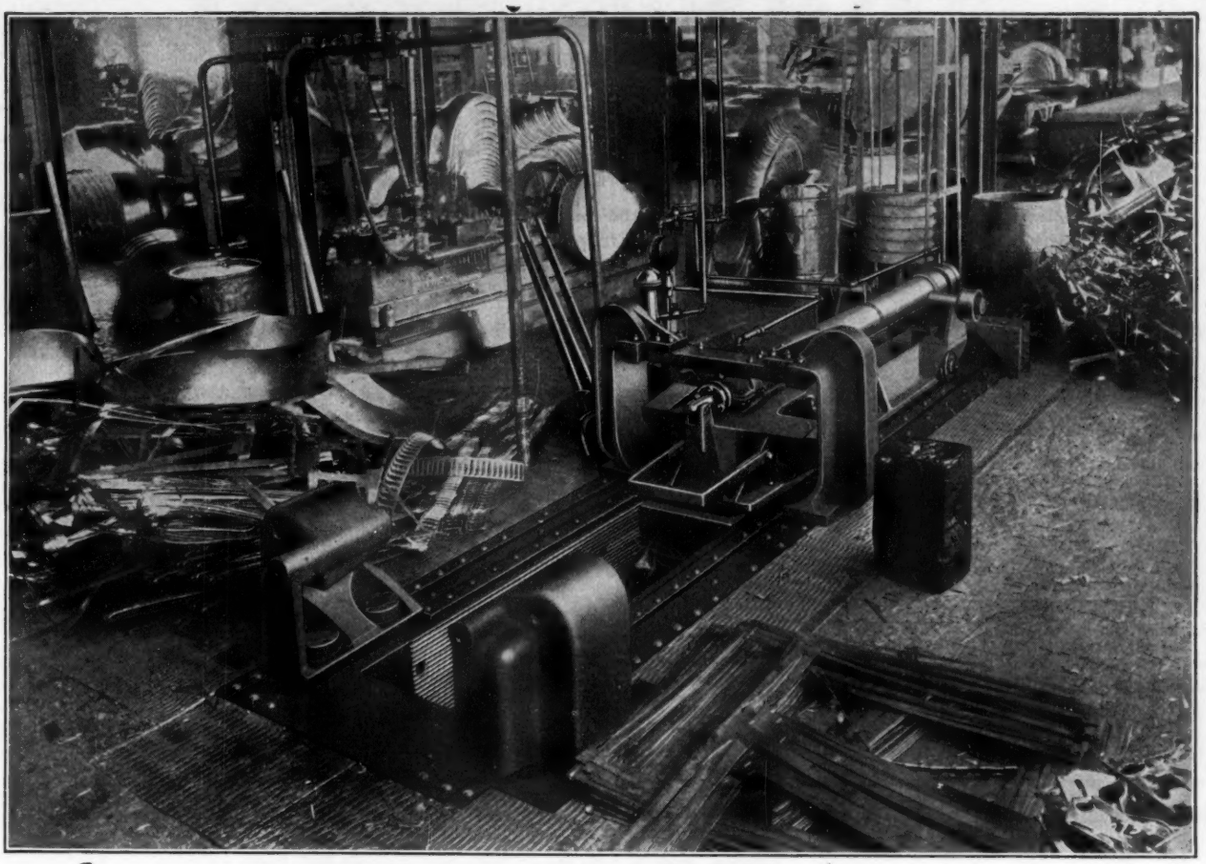

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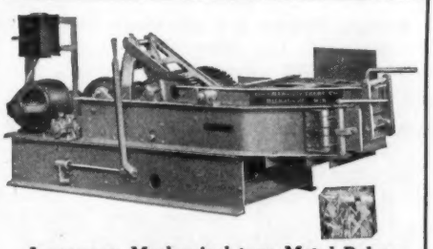

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Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
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Pacific Coast Steel Co., San Francisco, Cal.
Pollak Steel Co., The, Cincinnati, O.
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